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THE

THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

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ORIGINAL COMMUNICATIONS.

DIETETIC AND MEDICAL TREATMENT OF CANCER.

BY L. DUNCAN BULKLEY, A.M., M.D.,

Senior Physician to the New York Skin and Cancer Hospital, etc.

In some of the reviews of my book on "Cancer, Its Cause and Treatment," the regret has been expressed that I had not given more exact details in regard to the treatment employed in obtaining the favorable results in the cases reported. This brevity was necessitated in part by the length and character of the lectures, which aimed rather at demonstrating the metabolic character of the disease, for further study and proof; and in part by the difficulty of being more definite, within the compass of the lectures, concerning the many and various measures necessary to restore perfect metabolism, and so alter the system to an anticancerous state, for each cancer case requires very special study and often most varied treatment. It was also supposed that the practicing physicians attending the lectures would be able to apply the principles enunciated.

It must be understood that there has not yet been demonstrated any one definite state or condition of the system which certainly leads to cancer, and perhaps there may never be. But all observation, as well as statistical evidence, and some laboratory studies, point so strongly to cancer as a disease of advancing civilization, and scientific research has so clearly eliminated the many suggested causes of malignant disease, that we are forced by exclusion to look to metabolic changes in the system as its cause. These, leading to a disordered blood stream, favor the disordered growth of certain body cells, culminating in masses to which we give the name of cancer. For no one questions that nutrition, good or bad, depends on the character of the blood furnished to the body cells.

In many reviews, and in notices of a former article,[1] I have been quoted as regarding meat-eating as the cause of cancer. This is only partially correct; although I have shown that the incidence of cancer is closely related to an increase in the consumption of meat in many localities, and have pointed out its relative infrequency in herbivorous animals and vegetarians. But the very fact that it may occur even among them proves that there is some other causative element not yet fully determined. I have also referred to high authorities who have satisfactorily demonstrated a metabolic disturbance of protein elements in cancer subjects, and an imperfect nitrogenous partition in the urine. Much more study will be necessary, both of the blood, including its plasma, and the various secretions and excretions, both in the very early stages of cancer and also after surgical removal, if we wish to learn all the conditions which lead up to the tumor formation and its recurrence after operation.

Long ago Abernethy wrote: "There can be no subject which I think more likely to interest the mind of the surgeon than that of an endeavor to amend and alter the state of a cancerous constitution. The best timed and best conducted operation brings

[1] Bulkley: Relation of Diet to Cancer. *The Medical Record.*

with it nothing but disgrace, if the diseased propensities of the system are active and powerful. It is after an operation that, in my opinion, we are most particularly incited to regulate the constitution, lest the disease should be revived or renewed by its disturbance."

What then are the causes of this disturbed condition, and what are the means of rectifying them? The causes lie in the various elements which compose what we call modern civilization, and the escape from the disease lies in returning to the simple life and the avoidance of the causes of degeneration. Statistical and other proof has been presented elsewhere[2] to show that luxurious living, which includes the use of much animal food, coffee and tea, and alcohol, together with indolence, or want of sufficient muscular activity to burn up the waste products, in connection with the persistent neglect of hygienic laws, should be placed first among the causes of cancer. In one decade in England it was found that cancer mortality was more than twice as great among well-to-do men having no specific occupation, as among occupied males in general, the ratio being 96 to 44. Furthermore, it is now well recognized that the refining, preparation, and cooking of food often interferes with the proper supply of mineral and other elements of nutrition necessary to the system.

I know that it will at once be claimed that the disease occurs also among the poorer classes, who cannot be said to be subject to "luxurious living." But this latter is, after all, only a relative term, and we know that the poor continually do indulge in erroneous eating and drinking to a degree which does disturb metabolism in many directions, and we know what a large class of disorders of various kinds are thus occasioned among them. It has, however, been definitely shown in England, where statistics are accurately kept and analyzed, that cancer is very much more prevalent per 100,000 in those parts of cities which are occupied by the well-to-do than in the poorer sections.

[2]Bulkley: Cancer, its Cause and Treatment, New York, 1915.

The guiding of the diet for these cases is often not a simple matter. Protein the system must have, to build up and regenerate the cell life of the body. But the ox and the sheep get their protein, and even the iron, which man seeks in their flesh, from the ground, and the vegetable kingdom contains abundant proteid and mineral substances, even for man, if they are rightly sought for. And it is recognized that herbivorous animals, as also primitive races who subsist on the products of the ground, are relatively or quite free from cancer, whereas carnivorous animals, as also domesticated dogs and cats, are especially prone to the disease; and it has been repeatedly shown experimentally that a purely vegetarian diet inhibits or greatly diminishes the receptivity of inoculation with cancer material in mice.

But it is rarely satisfactory to simply order the cancer subject to subsist on a vegetarian diet without some special directions in regard to the same; this is especially true in regard to the poorer and more ignorant classes, and when it is attempted it is surprising to see how much they depend on animal food in some form or other.

To aid in understanding and carrying out treatment perfectly in the out-patient clinic for the medical treatment of cancer, at the New York Skin and Cancer Hospital, a four-page card has been prepared which is given to each patient, with instructions to study it and carry out every detail perfectly. On the outer sides are instructions in regard to cancer, and the danger of neglect, together with directions in regard to the preparation and consumption of food, mode of life, etc.; and on the inside pages a menu, or diet list, for each meal, for six days, which is here presented. This is to be repeated over and over again, and by this means the same diet does not fall on the same day of each week.

DIET FOR CANCER.

FIRST DAY.

Breakfast.	*Dinner.*
4 ounces Rice.	5 ounces Vegetable soup.
3 " Corn bread.	3 " Baked potatoes.
1¼ " Butter.	3 " Stewed celery.
½ " Sugar.	1 " Graham bread.
Hot water.	1¼ " Butter.
	1 Fresh apple.

Supper.

4 ounces Rolled oats.
2 " White bread.
1¼ " Butter.
4 " Stewed prunes.
¼ " Sugar.
Very weak tea.

SECOND DAY.

Breakfast.

Orange.
4 ounces Hominy.
2 " Graham toast.
1¼ " Butter.
½ " Sugar.
Postum.

Dinner.

5 ounces Pea soup.
3 " Macaroni.
3 " String-beans.
3 " Carrots.
2 " Bread.
1¼ " Butter.
Dates.

Supper.

4 ounces Cream of wheat.
2 " Graham toast.
1¼ " Baked apple.
2 " Crackers.
1¼ " Butter.
¼ " Sugar.
Very weak tea.

THIRD DAY.

Breakfast.

Banana.
4 ounces Pettijohn.
2 " White bread.
1¼ " Butter.
½ " Sugar.
Hot water.

Dinner.

5 ounces Corn soup.
3 " Baked potatoes.
3 " Spinach.
3 " Boiled onions.
2 " Bread.
1¼ " Butter.
Raisins.

Supper.

4 ounces Farina.
4 " Stewed figs.
2 " Graham crackers.
1½ " Butter.
¼ " Sugar.
Very weak tea.

FOURTH DAY.

Breakfast.

Raw apple.
4 ounces Cornmeal mush.
2 " Graham bread.
1¼ " Butter.
½ " Sugar.
Postum.

Dinner.

5 ounces Vegetable soup.
4 " Baked beans.
3 " Cauliflower.
3 " Asparagus.
2 " Bread.
¼ " Butter.
Orange.

Supper.

4 ounces Rice.
4 " Stewed prunes.
2 " Graham crackers.
1¼ " Butter.
¼ " Sugar.
Very weak tea.

FIFTH DAY.

Breakfast.

Orange.
4 ounces Cracked wheat.
2 " Corn muffins.
1¼ " Butter.
½ " Sugar.
Hot water.

Dinner.

5 ounces Sago soup.
4 " Spaghetti.
3 " Lima beans.
3 " Boiled onions.
1¼ " Butter.
Dates.

Supper.

4 ounces Cream of wheat.
Sliced orange.
2 ounces Oatmeal crackers.
1¼ " Butter.
¼ " Sugar.
Very weak tea.

SIXTH DAY.

Breakfast.

4 ounces Samp.
2 " Graham toast.
1¼ " Butter.
½ " Sugar.
Postum.

Dinner.

5 ounces Celery soup.
4 " Baked potatoes.
3 " Carrots.
3 " Spinach.
1¼ " Butter.
2 " Bread.
Figs.

Supper.

4 ounces Wheatena.
4 " Stewed figs.
2 " Uneeda biscuit.
1¼ " Butter.
¼ " Sugar.
Very weak tea.

This diet list has been pretty carefully worked out, so that it totals an average of about 2200 calories for each day, with 140 of vegetable protein, and a proper proportion of fats and carbohydrates. For some months this has been used, both in the hospital and in private practice, with very satisfactory results, and patients have thrived on it and increased in weight. It may be interesting to give also the contents of the last page, which contains directions to assist in carrying out this line of treatment:

"Some interchange of the different articles may be made, to suit the appetite or convenience of patients; but in the main this bill of fare should be followed.

"Bread at least twenty-four hours old may be taken as desired.

"A little old cheese may be grated on the macaroni and spaghetti, but not cooked with it.

"One boiled or poached egg may be taken for breakfast every other day, and very fat bacon on the alternate days, unless otherwise directed by the physician.

"It is desirable to eat the skins of potatoes.

"Each and every meal should be eaten very slowly, for half an hour, with long chewing.

"One tumbler of water is to be taken with each meal, but not when food is in the mouth; also a tumblerful of hot water one hour before breakfast and supper.

"No milk is taken unless specially ordered.

"The cereals are to be boiled with water, three or four hours, and may be cooked in the afternoon and heated in the morning, adding more water. Rice, farina, and cream of wheat require only an hour. Chopped dates, figs, raisins, or currants may be added to cereals when desired.

"All the cereals are to be served very hot, on hot plates, and eaten with butter and salt to taste (not milk and sugar). They are to be eaten very slowly, with a fork, and very well chewed.

"The crackers with supper may be varied to suit the taste; they should be eaten dry, with butter, and chewed very thoroughly.

"Nothing should be taken between meals, unless especially directed, and the life should be as simple and healthful as possible, with early and long bed hours."

The physician, therefore, who would successfully overcome a cancerous blood state, whether in a very early stage of the tumor or in its fuller development, or even when it has recurred, must fully realize the gravity of the problem involved and the seriousness of the work he has undertaken. He must study and strive to understand metabolism and its relation to the nutrition of the tissues. He must make, or have made, very frequent volumetric studies of the urine, in regard to all its ingredients, and grasp and rightly interpret the findings, certainly weekly, in connection with the diet and medication of the patient, which must be guided thereby, for it must be remembered that imperfect and deficient urinary secretion is a common forerunner and accompaniment of cancer.

He must also watch and study the patient in all aspects of life, for, as shown in the work already alluded to, there are very many elements which contribute to the degraded blood stream back of the malignant disease which results in the local lesions which we call cancer. Bad sanitation of all kinds, mental shock, strain, and worry, irregular bed hours, imperfect or neglected intestinal excretion, rapid eating and imperfect mastication, and a thousand errors in eating and drinking, all contribute to this, which cannot be treated of in a brief article, but are more or less developed in the reference mentioned.

It is readily seen, therefore, that the dietetic and medical treatment of cancer cannot be compassed in a small space. Nor can it be acquired or accomplished without very serious and continued thought and work on the part of the physician; moreover, it must be recognized that infinite patience and perseverance on the part of both physician and patient are requisite to overcome a condition of system which has been slowly developing long, long before the first vestigium or trace of the local lesion has been deposited. And when the malignant local process, or cancerous mass, has once been started, and especially when it has become at all well developed, and its cells are giving forth a secretion or hormone which is poisonous to animals and assists in poisoning the blood stream and degenerating its corpuscular elements, it is readily seen that it is a most difficult task to reverse the wrong metabolism, to regenerate the depraved blood, and to cause the absorption or return to normal of the diseased cells forming the tumor. However, this dietetic treatment must be continued a very long time, or indefinitely, in order to obtain satisfactory and permanent results. But that this latter can happen is abundantly shown by occasional cases of unquestioned cancer known to have entirely disappeared for many years, and sometimes reported, and also by my own experience during the last thirty or forty years, as detailed somewhat in the work already referred to.

But it must be here understood that, inasmuch as a well-developed cancerous mass has already become a menace to the system, by the degenerative properties of its secretion or hormone, it may be, and often is, desirable to remove the same, whether by the knife, *x*-ray, radium, or even caustics. But this local treatment or removal of the local product of disease can seldom, if ever, be undertaken alone with a positive expectation of a permanent cure, unless proper measures are faithfully and persistently carried out, almost indefinitely, "to alter and amend the state of a cancerous constitution, lest the disease should be revived or renewed by its disturbance," as Abernethy so wisely remarked long ago.

I am, of course, quite conversant with the good and even permanent results which follow the local treatment of cutaneous epithelioma, whether by caustics, *x*-ray, radium, thorium paste, or the knife; but these local lesions, which rarely metastasize, should be distinguished from cancer of the breast and internal organs, which furnish the bulk of the distressing cases which thus far have baffled control.

The dietetic treatment of true cancer, then, both prophylactic and active, consists in an absolutely vegetarian diet, so rightly proportioned in its vegetable protein, carbo-

hydrates, and fats as to afford perfect nutrition, and so arranged and administered as to be acceptable and attractive, in order that the patient may be constantly conscious of a general well-being and exhibit a steadily improved state of health. All this and other treatment should be carried on with confidence and an expectation of good results, for undoubtedly faith and hope contribute greatly to all therapeutic success, whereas the despondency attending the existence of cancer, and its reputed incurability, also contribute much to the disastrous results commonly observed.

The actual *medical treatment* of cancer cannot be briefly detailed, as may be judged from what has preceded, and because individual cases may require most different therapy to meet individual requirements; but some salient points may be mentioned. There is not, and probably never will be, any single remedy, or specific, "good for cancer;" although innumerable remedies, quack and other, have been vaunted, only to vanish after their uselessness or worse had been demonstrated by the disappointed hopes of many credulous sufferers. The very nature of the disease would indicate this, and would also indicate that no serum or vaccine would ever be found which could permanently effect a change in the metabolic conditions inducing the tumor formation, and the subsequent disastrous systemic conditions ending in death. It is, therefore, not proposed to offer any new or special remedy which can cure the disease.

But everything can be done, and very much should be done, both in the very early stages and late in the disease, for experience shows that these can have a profound effect in influencing the metabolic errors productive of cancer, or the precancerous conditions, as I have already pointed out;[1] these, with proper dietetic treatment, and attention to every hygienic detail, can not only check the cancerous process when once begun, but can cause the entire removal of early lesions, and even those later in the disease, including metastases. It is understood, of course, that this involves months of time, and with so terrible and treacherous a disease proper measures may be required indefinitely.

First in importance in connection with the internal treatment of cancer come measures which relate to body elimination, which is found to be imperfect in both the early and late stages of the disease, as I have shown elsewhere.[2]

Constipation or imperfect intestinal action, or intestinal stasis, as it is now called, is a prominent feature, both in very early cases and in those well developed. So constantly have I observed this, in large numbers of cases, that I have come to look upon toxic infection from the millions of microorganisms in retained feces as one of the chief elements in the degeneration of the blood stream which leads up to cancer. And this cannot receive too much care and attention from the physician in charge, and should be looked into so constantly as to secure a free, normal action of the bowels after breakfast and even oftener. It is impossible to go into details of this homely matter, but I can hardly speak too strongly of the importance of it, as I have learned from experience. It is not enough to give purgatives from time to time, nor do I find the use of mineral waters is desirable in these cases. I much prefer the vegetable laxatives very judiciously administered, which can commonly be diminished or dispensed with under the effect of proper food and abdominal massage.

The urinary excretion is invariably disturbed in cancer, and even very early in the disease indicates errors in the blood stream which should be most carefully watched and attended to. Few realize that the urine is secreted directly from the arterial blood, after it has received its nutriment from the alimentary canal and has been submitted to the action of the secretions of the various organs, including the ductless glands, as also to its oxygenation by the lungs. The kidneys therefore must be looked upon as the final judge and jury, in determining what perfect blood should be, exhibiting in their secretion the results of their efforts to re-

[1]Bulkley: Precancerous Conditions. *Interstate Medical Journal*, July, 1915.

[2]Bulkley: Cancer in Relation to Body Elimination. *New York Medical Journal*, July 3, 1915.

move elements injurious to the system and to keep the blood in a normal state. When we speak, therefore, of influencing the urine by dietary or other treatment, it only refers to the employment of such measures and remedies as shall rightly regulate the nutrition of the system, promote perfect metabolism, and secure adequate and normal elimination of injurious products.

In this sense, then, the urine, if very frequently and completely studied volumetrically, in its very many components, and correctly interpreted, affords us one of the very best aids in understanding and correcting the metabolic errors which underlie cancer. Mention has already been made that the nitrogen partition in the urine is generally at fault in cancer, as shown by repeated research laboratory reports; the urea is low and the acidity high, and alkalies, especially the acetate and citrate of potassa, play a considerable part in overcoming the systemic error.

But, as already stated, it is really impossible to give briefly and at all clearly any line of treatment which is to be invariably followed for the months or years necessary to overcome the cancerous condition. For it must be remembered that, as in regard to tuberculosis, whose death-rate, according to the United States mortality tables, has fallen over 25 per cent since 1900, by prolonged proper feeding and prolonged medical care, so in regard to a similarly chronic condition, cancer, there may be the need of any number of remedies from time to time to accomplish the end desired. This is no idle comparison, and only by recognizing the disordered constitutional state in cancer subjects, and by applying the most careful and intelligent medical measures, with proper diet and hygiene, can we overcome this dire disease, or prevent its occurrence. But that this certainly can be accomplished in a very much larger percentage of cases than is obtained by our present general method of surgery, etc., has been abundantly shown, and that with the general adoption of these views by the profession and laity there will be a material diminution in the morbidity and mortality of cancer is equally certain. It will undoubtedly take a long time to effect a startling change in the general death-rate from cancer, but with the faithful and continued application of these principles there can be little doubt but that time will show a steady diminution in the morbidity and mortality from this disease comparable at least to the twenty-five per cent reduction which has occurred in tuberculosis since 1900, by proper hygienic and dietetic measures.

351 Madison Avenue.

REPORT OF A CASE OF TETANUS.

BY FRANK BIRD, M.D., VALDOSTA, GA.

The following report of a case of tetanus successfully treated by tetanus antitoxin is of interest in that it emphasizes more than one important point in connection with this disease.

January 12, 1915. The patient, a white male, aged twenty, while walking in a darkened hall stumbled against a nail projecting from a box (containing coal). The nail caused a wound one-half inch deep situated four inches above the patella. Four hours later the wound was painted and swabbed out with Churchill's tincture of iodine, and sterile dressing applied. No pain or discomfort complained of.

January 13. The wound redressed, apparently doing well.

January 14. Wound shows some redness. Interior cauterized with carbolic acid. The patient walks with the leg extended and limps, but says that he has no pain. When asked to flex knee he does it slowly and deliberately, as if in anticipation of pain and through an angle of one hundred and fifty degrees, an almost normal although restricted flexion.

January 15. Redness around wound is increased and restriction of movement is increased. Some swelling appears about the knee-joint. The wound is kept open

and interior cauterized with carbolic acid. Patient asked to return in afternoon. He was given an immunizing dose of tetanus antitoxin, 1500 units, at six o'clock, and ordered to bed. The general condition of the patient is absolutely not disturbed. No change of the pulse or temperature; no general muscular stiffness or spasms; no trismus; no disturbance of appetite. Says he feels perfectly well and does not want to go to bed. Has no pain. Muscular rigidity is entirely local, involving apparently only the quadriceps femoris group of muscles of the right leg.

January 16. Rigidity of leg neither increased nor decreased. Pain experienced at site of injection of antitoxin. In the afternoon of this day the stiffness is increased and there is some pain in the knee. The leg is by no means rigid. There is some movement, but it is limited and slow, accompanied by a sense of muscular resistance. The leucocyte count is 10,600. Three thousand units of antitoxin given into the quadriceps muscles, this site being selected for the injection on the theoretical basis that it would neutralize and intercept some of the tetanus toxins on their way to the general system.

January 17. Patient can only flex the knee between fifteen and twenty degrees. General condition good. No other muscles involved in spasm than those mentioned before. There is apparently no effect on the general system from either the antitoxin or the toxin, except that the disease seems to be more or less arrested. To say the least, if it has progressed in the last twenty-four to thirty-six hours it is almost imperceptible. At 4 P.M. the leucocyte count is 11,200. General condition is unchanged. At 8 P.M. flexion of knee from twenty to twenty-five degrees; at same hour three thousand units of antitoxin injected into the buttock of the left side. The stiffness is entirely confined to the right leg.

January 18. A.M. Flexion of knee twenty-five to thirty degrees. General condition unchanged. No pain in leg or wound. Wound kept open and cauterized with carbolic acid. Temperature normal. At 4 P.M. leucocyte count 10,600. At 8.30 P.M. six thousand units antitoxin given into the back of right leg, as nearly as possible into the region of the sciatic nerve.

January 19. Flexion thirty to thirty-five degrees. Swelling of the wound and knee is less. Patient says he feels all right and he has a good appetite. At 4 P.M. leucocyte count 9400. At 8.30 P.M. fourteen thousand units of antitoxin given intravenously under aseptic conditions. Fifty minutes following this injection the patient was seized with a violent chill and was given morphine ¼ grain, with atropine 1/150 grain, which controlled the chill very shortly and patient passed a restful night.

January 20. Flexion of knee fifty to sixty degrees. General condition unchanged. At 4 P.M. leucocyte count 7600; flexion sixty-five to seventy degrees. At 8.30 P.M. flexion seventy-five degrees. The amount of flexion is so free, the muscular resistance in the leg is so much less, and the patient generally seems to be so much improved, that it is not thought advisable to continue the antitoxin. Temperature 97.8° F.

January 21. Flexion practically normal. The resistance is still diminished. Swelling of wound and knee has receded. At 4 P.M. the leucocyte count is 6400; at 8.30 P.M. the temperature is 97.6° F. No antitoxin given.

January 22. Flexion normal. Temperature 98.4° F. On palpation the muscles of the leg are relaxed. Patient has no pain or discomfort while flexing the limb. At 4 P.M. the leucocyte count is 7800; temperature 97.6° F. On both arms urticarial wheals are appearing. They are a rosy pink, raised, irregular in outline, varying from one-quarter to three-quarters of an inch in diameter. This shows a serum reaction (anaphylaxis). At 8.30 P.M. wheals are appearing on other parts of the body, especially the chest and the legs. They cause some discomfort by itching.

January 23. The wheals are thickly scattered over the entire body, almost confluent. The patient looks as if he was swollen. The face is reddened and the eyelids are puffed. The wheals are irregular in outline but more or less oval, varying from a quarter of an inch to an inch in

diameter. The itching and sensation of puffiness is controlled by large doses of sodium bromide, forty grains every four hours, and sponge baths of cool water containing bicarbonate of soda. From this time on the wheals disappeared and patient made a rapid and uneventful recovery.

CONCLUSIONS.

First, there can be no definite rules as to where a patient is liable to contract tetanus. We must remember that there are exceptions and be on the lookout for it in all punctured and lacerated wounds, especially, however, those inflicted by fireworks, blank cartridges, infected by garden earth or stable manure and street dirt. The above case is an exception to the general rule. The box that patient stumbled on had been upstairs all winter, containing coal, and there is no telling whether he received the infection from the nail or from his own clothing.

Second, in all suspected cases an immunizing dose of tetanus antitoxin (1500 units) should be given into the buttock. If tetanus has already begun it will surely develop further.

Third, trismus and spasms are sometimes the first definite indications of tetanus, coming on after a wound has healed, but in about one-third of the cases the first muscles to be involved in spasm or to show rigidity are those in the vicinity of the wound, as in the above cited case.

Fourth, any rigidity occurring in the part, following the wound, should excite suspicions of tetanus, and at least the immunizing dose of antitoxin should be given or treatment begun at once.

The condition, tetanus, is caused by the action on the nerves of toxins liberated by the tetanus bacilli, the most poisonous of these toxins being tetanospasmin. The purpose of treatment is not so much to destroy the tetanus bacilli, but to neutralize this powerful toxin and destroy its union with the nervous system.

Fifth, bacteriological examination of discharges for purposes of diagnosis is a useless waste of valuable time. The symptoms and history are more reliable and save time. The incubation period varies according to the amount of toxin in the system; it is usually from two to five days.

Sixth, in the treatment of developed cases one large dose of antitoxin is more reliable and saves more time in the treatment and does a greater amount of good than several small ones frequently repeated. Consequently, fifteen thousand to twenty-five thousand units should be given (slightly warmed) into the blood stream under aseptic precautions for an adult dose. If chills should occur following the injection (which is not the rule), give a hypodermic containing morphine grain ¼, with atropine grain 1/150. Nothing is so effectual as the above in stopping the chill. If no improvement in symptoms is noted in twenty-four hours, give five to fifteen thousand units into the blood stream. In cases further developed coming under observation with a history of repeated spasm, risus sardonicus, trismus, and outlook poor, give five to fifteen thousand units antitoxin into the subarachnoid space and fifteen to twenty-five thousand units into the blood stream. (Before giving the injection into the spinal canal, allow about as much spinal fluid to flow out as the amount of serum that you intend to inject. This gets rid of some of the toxin as well as making space for the antitoxin.) If symptoms are unabated, repeat above procedure in twenty-four hours.

Seventh, anaphylaxis appears to be less liable to develop after a single large dose than after repeated doses.

Eighth, large doses of bromide, chloral, or chloretone will usually control the spasms after the above treatment has had time to take effect. It may be necessary in some cases to administer chloroform a few times. These drugs also alleviate the symptoms of serum reaction, but probably have no direct effect on the condition itself.

Ninth, temperature is an uncertain symptom, though it may be present.

Tenth, treatment of wound. Wounds should be opened, cleansed with bichloride, and swabbed out with iodine or cauterized with carbolic acid, and should be kept open. Finally, they should be allowed to heal by granulation.

HYPERTHYROIDOSIS ASSOCIATED WITH GYNECOMASTIA.

BY JOHN KING FREEMAN, A.B., M.D., LOUISVILLE, KENTUCKY.

The personal observance of what seemed to represent the association of unusual clinical phenomena—*i.e.*, hyperthyroidosis and gynecomastia in the same patient—furnishes the incentive for this paper. Because of the comparative rarity of the association of such phenomena, separate consideration under two headings appears most appropriate.

HYPERTHYROIDOSIS.

This subject has been elaborately and repeatedly reviewed by different writers under various designations (Graves's disease, Basedow's disease, exophthalmic goitre, hyperthyroidism, etc.) during the last hundred years, and the symptom-complex as at present understood was probably recognized clinically at a much earlier period. The affection is frequently encountered in females, but males are not exempt; and while it may occur at any age, the most cases are first noted between twenty and forty-five years.

The clinical symptoms of hyperthyroidosis generally recognized are: varying degrees of prominence of the eyeballs, with a peculiar staring expression of the patient; circulatory (cardiovascular) disturbances, such as tachycardia, systolic murmurs, cardiac enlargement; sometimes venous pulsation over the enlarged thyroid; muscular tremors and progressive physical weakness; excessive nervous irritability and excitation followed by periods of exhaustion; insomnia may or may not be present, but disordered sleep is the rule; irregular appetite, diarrhea, and occasionally emaciation; excessive perspiration has been noted; pigmentation and other cutaneous manifestations from trophic nerve disturbance; dyspnea has occasionally been observed; more or less hypertrophy of the thyroid gland occurs at some time during the course of the affection. The most prominent and annoying clinical manifestations are those resulting from circulatory and nervous disturbances.

Nothing definite is known concerning the essential etiological factor which is responsible for the production of hyperthyroidosis, the numerous and diversified theories hitherto suggested failing to adequately explain the reason for development of the observed clinical symptoms. There evidently early occurs marked increase in functional activity of the thyroid gland, but the exact reason for this has never been determined. All the theoretical evidence thus far deduced in relation to the etiology has been often presented, and its repetition would avail nothing; likewise, the manifold histopathological findings from microscopic examination of the extirpated gland structure have been so thoroughly described that the light of present understanding justifies no attempt at further amplification.

Hyperthyroidosis in the male sex is rather uncommon, yet of eighteen cases recently reported by Mayo five were in males ranging in age from twenty-nine to forty-seven years. He says that "up to July 1st, 1914, six thousand nine hundred and sixty operations had been performed for goitre in our clinic; of these, three thousand three hundred and twenty-seven were performed upon patients with hyperthyroidism." The percentage of males as compared with females is not given, nor is any mention made of associated gynecomastia in any case.

The treatment of hyperthyroidosis may be medical or surgical, depending upon the condition present when the patient comes under observation. In the earlier stages—*i.e.*, before the supervention of marked hypertrophy of the glandular structure of the thyroid, as in the case to be reported in detail—medical treatment is indicated. The tachycardia and nervous manifestations are sometimes most difficult to control. Other symptoms must be appropriately treated when they arise. The patient should be kept as quiet and free from excitement as possible. Later in the history of the affection, however, thyroidectomy properly executed may be expected to accomplish beneficial results, and is therefore worthy of consideration.

GYNECOMASTIA.

The accepted definition of the anomaly known as gynecomastia is the development upon a male of mammæ resembling those of a female, either with or without the secretion of milk. The idea that the mammary enlargement was invariably accompanied by testicular atrophy has been proven a mistaken assumption. The majority of such individuals enjoy excellent physical health, and present no other anomaly or anatomic conformation. In some instances development of the glandular mammary structure differs in no essential respect from that which occurs in the female, and the functionating capacity may likewise approach or equal that of the feminine breast. "The mammæ of men will, under special excitation, yield milk; and in famines infants whose mothers have died have been thus saved" (Spencer).

There are recorded, especially in the older literature, many curious instances where gynecomastics suckled infants.[1] Hunter refers to a man who shared equally with his wife the suckling of their children. A sailor whose wife had died nourished their infant at his own breast. In another case the husband sustained the infant with his own milk for five weeks after death of the mother. The ability of men to suckle infants appears more common in the Indian and negro than in the white races. Franklin refers to a Chippewa whose wife perished during childbirth and who nourished the infant at his own breast. The left mamma was used and thereafter retained its unusual size. There was said to have existed in Brazil an Indian nation whose "women had small and withered breasts," and whose children owed their nourishment entirely to the males. Hall mentions a negro of fifty-five "who had suckled all his mistress's family;" the mammæ projected seven inches from the chest; the genitals were normally developed. Paullini and Schenck cite cases in which men suckled infants, and similar instances are recorded by Ford, Robert, Meyer, Fernandez, and many other authors. Galen described the anomaly, Aristotle observed men with mammæ like those of a woman, and Aegineta noted the peculiarity among the ancient Greeks. Subsequently the subject was discussed by Albucassis, Bartholinus, Behr, Benedictus, Borellus, Bonet, Donatus, Schenck, Vesalius, Schachner, Martineau, Buffon—all of whom had noted the anomalous presence of milk in the male breast. Peuch stated that "the anomaly was observed in one out of every thirteen thousand conscripts."

Like the majority of other anatomic developmental peculiarities, while gynecomastia is probably prenatal in origin, the abnormal mammary development seldom occurs until adolescent or adult life. This fact induced the belief that gynecomastia must be an acquired peculiarity, and based upon this hypothesis certain authors attempted to show the etiological relationship of heredity, epilepsy, hysteria, neurasthenia, tuberculosis, alcoholism, carcinoma, traumatism, and other equally absurd and unrelated clinicopathologic manifestations. The theory of hereditary influence seemed especially plausible inasmuch as the anomaly has been noted in several members of the same family. For instance, Savitzky reports a gynecomastic individual of twenty-one whose father, elder brother, and a cousin were similarly endowed. The patient's mammæ were 33 cm. in circumference and 15 cm. from nipple to base, resembling the breasts of an adult female. The genitalia were normal in all respects.

About the limit of present etiological understanding is that gynecomastia represents an anomaly determined in prenatal life, usually not developing until after puberty, the essential causative factor of which remains submerged in apparently hopeless obscurity. To a marine surgeon (Bedor) is due the credit for the first scientific exposition of this interesting subject. An elaborate monograph was later published by Villeneuve, and numerous contributions have since appeared, the most exhaustive being the treatise of Laurent, which contains the illustration of a man with mammæ

[1]For many of the data presented herein, concerning the older examples of gynecomastia, etc., the writer is indebted to the admirable work on "The Anomalies and Curiosities of Medicine," by Gould and Pyle, of Philadelphia, Pa., and it is desired that full credit be extended these authors for the material excerpted.

measuring 30 cm. in circumference at the base and pendulous like those of a nursing woman. Petrequin speaks of a male mamma eighteen inches long which he amputated, and there is record of a Frenchman "whose mammæ were larger than those of an adult woman." Wiltshire refers to an individual who since puberty had noted mammary activity accompanied by secretion of milky fluid. Hutchinson describes several cases of gynecomastia in which "the external genital organs decreased in proportion to the size of the mammæ and the manners became effeminate." Ansiaux saw a conscript whose left mamma resembled that of an adult female, the nipple being surrounded by a large areola; this breast had always been larger than the other, but since puberty had markedly increased in size. The genital organs were normally developed.

Morgan describes a seaman whose right mamma was not unlike the well-developed lobulated breast of a woman in size and conformation; there was a large pigmented areola; nipple same size as that of opposite mamma. The breast began enlarging at sixteen and a half years, and steadily increased in size, but had contained no milk at any time. The external genitals were normally developed. Another similar instance was that of a healthy man with normal external genitalia, who was said to have cohabited regularly with his wife, and whose right mamma began to enlarge when sixteen. Glandular substance could be distinctly felt, but there was no secretion of milk. Left breast normal.

Von Eiselsberg refers to a lad of fourteen in whom hypertrophy of the right mamma began a year before; the progress was rapid at first, but later became stationary. A curious circumstance was that this boy's elder brother had a "swelling of the left breast" most pronounced about the nipple, which subsided in a few months. Quintrie mentions a man with lobulated well-developed mammæ and also anal menstrual discharge which had persisted eleven years. When thirty-eight left mastalgia occurred, and examination revealed a granule resembling a bean in that breast. The right also became enlarged; both attained the size of an orange, but neither secreted milk. The following year pain was noted in the sacrolumbar region and blood escaped from the anus for two days, recurring every twenty-eight days for eleven years. The rectum was normal; the patient was genitally perfect and the father of four children. The author remarks that gynecomastia with milk has not rarely been observed, but anal menstruation in the male is very exceptional.

Sommer mentions a boy of fifteen in whom a short time before both mammæ became painful and began to increase in size. The family history revealed nothing noteworthy. The axillary and pubic hair scanty, testes normal; both mammæ equally developed, two inches in height and three and a half inches in diameter at base; areolæ light; Montgomery's glands conspicuous; nipples prominent. The gland structure could be definitely outlined by means of palpation, but secretion could not be expressed.

Coe saw a negro of nineteen with abnormal mammary development; he was sexually precocious, and began sexual intercourse and masturbation at thirteen, at which time the mammæ commenced to enlarge. Occasionally mammary pain was noted, especially during sexual excitement, "and there seemed to be a direct relation between the two conditions." The mammæ were four or five inches in diameter, and showed distinct glandular structure and well-marked areolæ. The sexual organs were normally developed.

According to Ellis gynecomastia is comparatively common among criminals, many such men having large nipples with pigmented areolæ. In the penitentiaries, especially the reform institutions, where the inmates are principally adolescent boys, gynecomastia is frequently observed. "It is generally unilateral, sometimes bilateral, and ranging from a rounded development of bust and prominent nipples, surrounded by deep pigmented areolæ, to well-defined mammary glands that have periodic seasons of congestion and attempts at functional activity, sometimes accompanied by the secretion of an opaque fluid and a sensation

of pain and weight in the region of the nipple" (Wey).

Shufeldt states that when studying various types of people he encountered two or three marked examples of gynecomastia. In a paper published in 1910 he presented one of the most remarkable instances of this anomaly ever recorded. The subject was "Chief Chewango," a native Zulu, aged fifty-five years, six feet tall and weighing about four hundred pounds. He had married "according to the tobola custom" more than forty wives, was the reputed father of over one hundred children, "and the supposition is that he had nursed some of them." The genitals were entirely male,

fully functional and normal. While the measurements are not given, according to the illustration of "Chief Chewango" the mammæ were enormously developed and pendulous, reaching to nearly the level of the umbilicus, and resembling the breasts of a woman who had nursed many children. The color of the skin being dark, the areolæ are invisible, and in the photograph the nipples are imperfectly shown.

Although the classification appears useless, Gruber divides gynecomastia into three varieties: (*a*) that in which the male generative organs are normal; (*b*) that in which they are deformed; and (*c*) that in which "the anomally is spurious, the breast being a mass of fat or a new growth." Under the accepted definition already mentioned, any male having mammary hypertrophy is classed as a gynecomast, whether the development be glandular or otherwise, and regardless of whether the gland functionates or not, unless the enlargement contains definite neoplastic tissue; in the latter event the natural classification would be a mammary neoplasm and not gynecomastia.

It appears that gynecomastia must be more common than ordinarily believed. In this country the anomaly has always been considered rare, and few instances have been recorded. It is interesting to note, however, that previous to 1900 Schuchart collected nearly three hundred such examples from the literature of the world, and doubtless many cases have since been reported, but the records are unavailable for review. In no previously recorded instance, so far as can be ascertained, has the association of gynecomastia and hyperthyroidosis been noted, therefore the following personally observed case appears to possess features of unusual interest:

A. B., a male, aged thirty-seven, married, father of four healthy children. His mother is living at the age of sixty-eight; father died at seventy-two, cause unknown; no special history of disease in the family. The patient is one of eight children. A sister aged thirty has goitre, and one of his daughters developed enlargement of the thyroid gland at the age of fifteen.

In June, 1914, the patient presented himself suffering with nervous symptoms. He complained that he could not attend to his work as a harnessmaker on account of nervousness and general physical weakness. Quietude was advised, and rest in bed afterward ordered. His heart action was rapid, and he suffered considerable distress on the slightest exertion. His pulse was always over one hundred, and upon the least exertion or excitement it would rapidly rise, sometimes to a point where it could not be counted. Shortly after these nervous symptoms became manifest, an enlargement of the thyroid gland was noticed, and the patient's eyes presented a peculiar stare.

He was kept in bed for a month and thyreoidectin capsules (Parke, Davis & Company), 5 grains, ordered to be taken three times daily. In addition heart sedatives—strophanthin, digitalis, and convallaria—were prescribed. His digestive organs were carefully investigated, and after allowing him out of bed he was advised to take only gentle exercise and to avoid all excitement. Strophanthin and convallaria seemed to act best, but the thyreoidectin was continued. And it must be added just here that, in the early part of this man's affliction, I ordered thyroid extract, and in doing so made a mistake. His condition was aggravated by the administration of this remedy, for the reason that it was a case of hyperthyroidosis, not hypothyroidosis.

The patient suffered considerably from mental distress upon the least excitement or when anything unusual happened; he was exceedingly nervous and irritable; in fact his mentality seemed to be affected, and the

family were worried by the fear that he might eventually become insane.

Dr. H. A. Cottell saw the patient in consultation. We persisted in the treatment along the lines mentioned—strophanthin, digitalis, convallaria, thyreoidectin capsules—and the man has so markedly improved that six weeks ago he was able to resume his work, although he is still quite nervous and the staring expression is noticeable.

Photographs of the patient are exhibited. In addition to enlargement of the thyroid

gland, especial attention is directed to the other peculiar feature—*i.e.*, the abnormal development of the mammæ. This peculiarity was noted three months after the nervous symptoms appeared. Unfortunately the photographs do not show the mammary enlargement as plainly as could be seen with the eye. The focus upon the left breast is slightly better than the front view, and shows the large pigmented areola around the nipple. As the man was very sensitive he did not wish his face to show in the picture, therefore I present the photograph of another man with an enlarged thyroid gland to particularly illustrate the staring expression. In this latter case, however, there was no accompanying mammary enlargement.

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DISCUSSION.

DR. H. A. COTTELL: The case reported by Dr. Freeman is exceptionally interesting, because it represents an instance of hyperthyroidosis in a male which is rare, whereas in the female it is common.

In trying to develop anything in regard to the anomalous pathology as represented in this case, we are confronted by one of the deeper problems in medicine, and to determine anything definite concerning the etiology it would probably be necessary to revert to the intricacies of embryogenesis—*i.e.*, the factors which are concerned in determining the difference between male and female in the evolution of the fetus during uterogestation. It represents one of the more profound problems in physiology about which we shall probably never possess any greater enlightenment. That the mammæ should become enlarged in connection with hyperthyroidosis is a curious phenomenon which must be exceedingly rare. I do not recall having observed the two conditions associated excepting in the case reported.

There are several varieties of disease which may involve the thyroid gland. First is the simple hypertrophic enlargement often observed in young girls, but seldom in boys. In my experience of more than thirty years in medical practice I have rarely encountered enlargement of the thyroid in males, yet it is common in females. Why this should be so has never been adequately explained by physiologists. Simple hypertrophy of the thyroid, without tachycardia, without circulatory disturbance, is frequent in school-girls, and under tonics and alteratives (rarely cardiac stimulants) the enlargement subsides in the majority of cases. In others enormous hypertrophy of the gland ensues, which finally necessitates surgical intervention.

A sharp distinction must be made between simple hypertrophy of the thyroid and Graves's disease, as they are distinct and entirely different affections. Graves's disease is primarily a nervous manifestation characterized by tachycardia and other well-known symptoms, the tachycardia being secondary, probably due to hypernutrition from the "eternal pumping of blood" into the vessels which nourish the glandular structure. The possible later development of hyperthyroidosis and hypothyroidosis must be considered. Oftentimes patients with Graves's disease develop myxedema, and it is sometimes difficult to differentiate between the two conditions. From my experience I could relate numerous cases in which patients were treated for Graves's disease, and after the tachycardia had been relieved myxedema developed.

When I first saw Dr. Freeman's patient I thought the condition was rather serious, and for some time feared he would make little impression upon it. The patient suffered from hyperthyroidosis, and he prescribed thyreoidectin capsules manufactured by Parke, Davis & Company, which represent blood serum from thyroidectomized sheep. As Dr. Freeman has stated, early in his treatment of this case he gave thyroid extract, which of course made matters worse, as it "added fuel to the fire." When this agent was discontinued and thyreoidectin administered the patient began to improve.

In the treatment of hyperthyroidosis particular attention must be directed toward relieving the tachycardia. I have sometimes had patients with Graves's disease under observation for three to five years. I recall one case (female) especially in which I studied the disease for fully five years. The woman suddenly died from an intercurrent affection, much to my regret, because I believe she would finally have recovered from the hyperthyroidosis. This patient suffered almost constantly from tachycardia; the thyroid gland continued to

enlarge, and finally ceased to functionate, and she then developed myxedematous patches, principally about the ankles. I gave her sparteine, strophanthin, convallaria, and occasionally digitalis. I think digitalis should be used with caution in these cases, as it sometimes makes the patient worse. Strophanthin, sparteine, and convallaria are always indicated, but there are only certain times when digitalis is of benefit. I made a very careful study of that case. After the tachycardia had been relieved to a certain extent, the thyroid gland, which had already become functionless, showed marked reduction in size; the patient then became myxedematous, and it was necessary to cautiously administer capsules containing the thyroid substance. It was observed that small doses of thyroid gland—the thyroid sicca of the Pharmacopœia—would meet the indications. At first I gave her five grains four times a day, but as that quantity had a distressing effect it was reduced to two five-grain tablets a day, then one and a half tablets, and later one. I then ordered Burroughs-Wellcome thyroid tablets one grain each, and three of these per day not only controlled the symptoms, but the myxedema and other local manifestations subsided.

Of course the tachycardia gives us the greatest concern. The patient's heart action (systolic) is already too vigorous, and while the frequency may be reduced by the administration of digitalis, as a rule this drug should be withheld until the heart becomes feeble, when it may be advantageously employed. Strophanthin, convallaria, and sparteine are beneficial. I usually give sparteine in ¼-grain doses or more three to four times a day, and strophanthin 1/120 grain in tablet form is very effective and not disagreeable to the patient.

Dr. I. A. Arnold: About two years ago, while attending the clinics of Dr. Murphy, of Chicago, I remember that he had a case similar to the one reported by Dr. Freeman. In that instance, however, only one of the man's breasts was enlarged. There was a "red streak" extending from the thyroid gland to the mamma. Dr. Murphy incised the mammary enlargement, and found that it contained an accessory thyroid gland.

Dr. J. K. Freeman: I merely reported the case as one of the curiosities sometimes observed in the practice of medicine. This is the fourth case of enlarged thyroid gland that I have seen in males.

This man was so distressed at the time that it was quite a task for him to keep quiet long enough to have his picture taken, and he was completely exhausted by the nervous strain. His staring expression was similar to that of the man represented by the other photograph exhibited.

The patient has made a fairly good recovery, but what can be said about the prognosis? What can be reasonably promised the family? He is a comparatively young man, and they have been considerably perturbed over his future prospects. He has been able to resume his work as a harnessmaker.

For several months he was not allowed to leave his home. Later I had him come to the office, and after walking three blocks he would be in a state of nervous exhaustion. As stated by Dr. Cottell, strophanthin tablets have acted admirably in this case. The patient has been taking 1/100 grain three times a day. There does not seem to be any cumulative effect, and he has been taking that quantity for some time. I have had to give him bromides and chloral, but have not resorted to any of the opium compounds to produce sleep. For a while during the early part of last autumn he was restless and did not sleep well.

The case is quite interesting and I believe unusual. One significant point in the history is that his sister has a goitre, his daughter developed an enlarged thyroid gland, and a daughter of his first cousin also has a goitre. Whether this represents a family tendency or not, you can draw your own conclusions; but I am inclined to think it does.

IMAGINATION AND THE PROFESSION OF MEDICINE.[1]

BY HOBART AMORY HARE, M.D.,
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You will, perhaps, be surprised if I tell you that I have chosen for my topic "Imagination," with the hope that I may be able to show you what a useful factor it may be if properly utilized, and how harmful it may prove if it is not properly controlled. In some individuals imagination gallops off with their judgment so that they are in much the same position as Mazeppa strapped to the back of a wild horse. In others imagination lies so dormant that life is always a thorny and uninteresting pathway. In still others, in whom the fire of imagination burns brightly and normally, being under as complete control as is the fire in an open grate, it warms the heart, gives zest to life, leads to success, and makes the daily task interesting and joyful. In the man with a dormant imagination, or in the man who possesses no imagination, the practice of medicine, or of any other pursuit, is a road which "leads upward all the way; yes, to the very end." He leads a leaden existence because "a primrose by the river's brim, a yellow primrose is to him, and nothing more." Such an unfortunate individual may be considered to lead his life in narrow alleys in which the sunlight rarely falls, while he who has a well-developed and well-controlled imagination walks in wide avenues filled with sunshine and fresh air. Imagination gives talent to the artist, the sculptor, the author, the investigator, the explorer, and not least to the medical man. It changes wearying toil into enjoyable exercise. Without it the world would cease to advance, for if there was no image in the minds of men of what may be found by research, towards what goal could they strive? It took imagination to conceive the telegraph, the telephone, the multiplied uses of electricity, for the development of the science of bacteriology, preventive medicine, and modern therapeutics, and, for that matter, all the advances known to the world.

Laennec, the great French clinician, seeing a child amuse itself by listening at one end of a log while another child struck it with a stone, had his imagination stirred and devised the stethoscope, and Bell, seeing a child strike two stones together under the water while another child submerged its head to hear the noise transmitted through the water, got his first glimpse of the telephone.

It made Cope a great paleontologist and sent Leidy through his life surrounded by beautiful things, some of them ugly to the ignorant and unimaginative, but all of them lovely when viewed through his imaginative eyes. So lowly a thing as a rhizopod, or the flora and fauna of the intestinal canal of the rat, possessed interest and beauty for him when studied with the aid of his imagination, and they appear beautiful, even to us, when we examine the pictures of these organisms which he drew from life. Many years ago, where the laboratories of this Medical School now stand there was a bank of earth and stone through which a street had been cut. Leaving the Biological Department, where I was at that time attached to the Staff, I found Leidy standing at the foot of the bank examining closely a piece of rotten stone which had been dislodged by an Irish day laborer, who was prying off the top of the bank with a crowbar. The day laborer was regarding Leidy with very much the same degree of interest that Leidy was regarding the piece of rotten rock. As I approached, the laborer surreptitiously pointed to Leidy with an expression on his face which was a combination of jeering and pity, intimating that he thought the old man was, in his vernacular, "dotty." Here, you see, was an instance of a very small amount of imagination improperly controlled. When I approached Leidy, knowing full well that I could not approach him without learning something, with keen delight he described

[1]An address delivered before the students of the Medical School of the University of Pennsylvania, December 8, 1915.

the geological period in which this rock was formed, the conditions at various times which had resulted in its present disintegration, and, with still greater interest and delight, explained to me that he had met with this same vein in the neighborhood of Swarthmore tending in a direction which had led him to believe that it would be again found at West Chester, but never thinking that it would appear in West Philadelphia. He then took up the possible causes for its diversion from its normal pathway and, with his knowledge of geology, drew a fascinating picture of things which had happened in prehistoric times. I have often thought of that picture, presented by the laborer gazing down at Leidy, and Leidy, gazing down at the stone, unconscious of the former's presence, as one of the most striking contrasts between ignorance and learning, between labor and imagination, that the world could present. Take care as you go through life that you do not fall into the class of the man with the crowbar; however worthy his labor may be, see to it that you utilize the gifts of which he was not possessed, but which were given to you so that your feet may at least be placed upon the lower rounds of the ladder upon which Leidy climbed far away from the dross of earth into the golden sunshine of research.

Sometimes persons who know nothing of medicine express surprise that we find it interesting or even tolerable as a pursuit. They do not know that if we have the real ardor and imagination, we see in every case of disease alterations from the normal which are just as striking to us, and more important to humanity, than the wonders of Niagara, or the magnificent splendor of a raging sea, nor do they appreciate that in combating each individual disease we see the natural history of normal function distorted as Leidy saw the vein of rock deformed. That we see the imaginative and sympathetic aspect of the case, the varying mental attitudes of the relatives of the sick man, some of whom allow their imagination to distress them and to destroy their judgment, while others seem stupefied and inert, regarding the sick man as an onlooker would regard a ship tossed on the rocks by the sea, feeling that they are powerless to be of service.

The laity often fail to understand that by the use of our imagination we devise means to prevent other wrecks, whereas the ordinary onlooker at a shipwreck sees only the existence of a horrible catastrophe and rarely thinks out a plan whereby another calamity can be put aside.

He who knows nothing of the subject cannot understand how a medical man can see in a morbid growth, a typhoid ulcer, or the swollen glands of bubonic plague, as interesting changes in the life history of cells as a botanist sees in the development of a flower and the artist sees in the changing colors of a sunset. While to the lay mind such a statement may seem excessive, to the trained mind which can put aside that which at first appears disgusting, the fact is evident, and, furthermore, by the use of the imaginative faculty, we not only study the pathological process which is present in a single individual, but determine how we may prevent its recurrence in generations yet unborn. As I have already said, what more dreary life, filled with misery, can be found than that of the medical man who has no imagination? He sees in a cancer only pain, toxemia, and an offensive slough. What more hopeful and buoyant life than that of the medical man who sees before him the actual processes involved, and who strives to aid in the better conception of the disease in order that he may have not only a comfortable glow of knowledge but the joy of efficient service?

The man in the street sees that which interests him in a great crowd, pushing and jostling, and his interest is intensified if it begins to do damage, but he rarely goes so far as to allow his imagination to analyze the causes for the presence of the mob, or to consider the ultimate results of its existence. The physician at the bedside in the presence of acute inflammation sees in his imagination, as he would see actually through a microscope, another crowd composed of red blood cells passing rapidly along the center of the stream with lazy

white cells lagging along the walls of the vessels, just as the members of the mob on its margin stop and look in the windows of the stores. An accident occurs and the crowd of cells hesitates, the lazy white cells stop and soon begin to wander out into the adjacent parts. So many of them gather, with the object of out-wandering, that the vessel is soon completely blocked at the point of excitement. Other abnormal changes occur and, possibly, local death takes place, and after this the physician once more clearly sees in his mind's eye the wonderful processes by which nature clears up the results of the disaster, completely restores the part, or walls it off, when restoration is impossible, with far greater efficiency than it could be done by human hand. With these facts before him the medical man sees in a case of inflammation a complete study in natural history, and by the use of his imagination, coupled with investigation, develops measures to control a similar process if it arises in another individual.

But the physician who uses only his imagination in studying the disease of his patient without also studying his mental processes, and those of his friends and relatives, has only in part fulfilled his office and done little for his success as a practitioner. The imagination should tell the physician that each mind differs from its fellow in health and still more so in the presence of disease, and that changes in mental processes develop in the friends and relatives as well. Under these circumstances the physician's ability by the use of his imagination, to put himself in the place of the patient, or his friends, will enable him not only to treat the patient successfully, but to be a source of comfort and support. In the carelessness of youth and under the benumbing effects of long experience there is always the danger of regarding what to us is an every-day experience, as being of little moment to the patient, and, not rarely, it is only when the physician becomes ill that the proposition seems peculiarly interesting and novel. Your imagination will let you see clearly that when a human being is traveling along a road that is beset with new conditions, and possible death, he is in quite a different position from the onlooker, who, standing "on the side lines," to use a foot-ball phrase, sees the sick man swept off his feet by a swirling flood of complications and then drag himself out on the hot path of his fever for another trudge.

Imagination will also often reveal the fact that the physician is not needed so much to minister to the patient who is ill as to those members of the family who, not stupefied by disease, are suffering from anxiety and distress.

There is still another bearing of this subject, namely, the use of the imagination in your intercourse with professional colleagues. If you use this faculty of the mind you will probably never be guilty of a breach of professional ethics or courtesy, for you will be continually imagining how you would feel if you were in the other man's place. When as young practitioners you start out, filled with knowledge, your imagination will picture to you the way you will feel when, as a practitioner of thirty or forty years, you see a youngster settle in your town to be a competitor. Such a view will tell you how to act toward your senior, and your imagination had better go far enough to recognize that, while you may know many things taught by books, your older colleague knows many things taught by experience.

Imagination enables us to put ourselves in the other man's place and to see things as he sees them instead of as we see them. It, therefore, makes us just instead of unjust, merciful and tolerant, and he, with such a lively imagination as to see things as others see them, is sure of success, since he has a broad view and knows others as well as himself.

So far I have discussed with you the value of imagination properly used. The other side of the picture must be studied as well. While all the advances of the world may be truthfully said to be due to a well-guided imagination, most of the woes of the world may be said to result from imagination badly controlled — in other words, poor judgment. Uncontrolled

imagination is the producer of the crank, the socialist, the anarchist, the extreme pacifist, the extreme militarist, and is characteristic of the insane, in whom, as a manifestation of lack of balance, it is supreme. An insane pauper in Blockley who imagines he is Napoleon Bonaparte, or the Ruler of the World, is much less dangerous to the community than he who, while classed as sane, promulgates opinions, born of an uncontrolled imagination, which, because they glitter, catch the eyes of the unimaginative and lead them to believe in tinsel instead of gold.

It is easy to criticize the President of the United States for not taking a belligerent attitude, but, if you use your imagination, you may grasp the idea that he knows we are not prepared to be belligerent, unless we are also prepared to be badly thrashed, and you can imagine also that he cannot tell us this fact, for obvious reasons, even if he wants to defend himself. So, too, the pacifists state that officers of the army and navy want preparedness because they wish to magnify their importance and promote war. What a wild flight of the imagination this is! No one can see the power of modern guns and the horror of war and yearn for a share in it for the mere sake of fighting. A well-balanced imagination will enable us to perceive that the real reason a naval officer pleads for preparedness is the reason that would animate any of us if placed on a sheriff's posse and told to arrest the leaders of a mob armed with rifles while we of the posse were armed with canes. There would be a cry, We are ready to do our duty, but do not send us out to be butchered uselessly; if we must die in the line of duty, at least give us a fighting chance and let us accomplish something, even if we have to give our lives to service!

Bryan, when he advocated the silver doctrine, imagined he knew more about the science of finance than those who had devoted their lives to it throughout the world, and he imagined that the United States, if they would, could make silver represent what they pleased regardless of what the rest of the world thought about it. Now he imagines that peace is possible in a world in which all natural history teaches that there can be no peace. As an abstract proposition, as an imaginative fancy, universal peace is above praise, but it can be found only in Utopia. All life, in every grade, is a struggle for existence, whether it be in the world of microörganisms, in the vegetable world, in the animal world, each preys upon the other, and by this system of predatory existence every living thing is kept within proper bounds as to number, extinction being prevented by reproduction. There is no reason for believing that man is controlled by laws different from those that control other animals, but he is equipped with a high mentality by means of which he protects himself, not only, as in primeval times, against beasts of prey of great size, but at the present time against beasts of prey of small size which we call germs of disease. Where reproduction is excessive and imagination has run in a land of dreams, as in India, so that human beings are not protected from disease, we see the population kept within approximate bounds as to the possibility of living off the soil by epidemics. Thus, bubonic plague carries off the excess of population, producing a yearly death-rate rarely less than the entire population of the city of Philadelphia, and sometimes causing this mortality in one province alone.

In those countries in which imagination has resulted in research and in the prevention of disease, space also does not exist for maintenance when reproduction runs ahead of mortality. The starving population sees fertile fields or rich industries in other lands, and, following the instincts of self-preservation, it proceeds to possess itself of those lands and industries. Their owners defend their property—blows are struck—and that means war. War means the destruction of thousands of the best of lives, and so inexorable nature balances the birth-rate by the death-rate, if not by one means, by another. This state of things may not be what we would like to have. It may be a picture horrid to look upon; but nevertheless, in the words of a recent President of the United States, "we face a condition, not

a theory." As long as the lion is hungry and the lamb is succulent, as long as some are strong and some are weak, that some are crowded and some are not, so long as every one wants to better himself, so long will one prey upon another, and so long will there be war, pestilence, or famine, which have heretofore kept the race from growing too big for the earth. All the great nations of the world have burst over their original boundaries. Those of the European Continent have established colonies for their overflow thousands of miles away. Japan, after a sleep of centuries, is startled into activity by its overcrowding and takes Korea. Men coming from all over the civilized world crowded upon the eastern shores of the United States and pushed the American Indian to the wall in order that the lands, which he knew not how to take care of, might produce sustenance and profit.

As it is the law of nature that survival goes to those who are best fitted to maintain life, so it is the law that to be strong in defence, and if need be in offence, is necessary to a nation's life, for a nation is, after all, but an embodiment of many men. When the day comes when robins no longer pluck worms from the ground, the fish-hawk touches not the fish in the shallows, the lion lies down with the lamb, and every man has all he wants, then we may imagine that there will be universal peace, but it will be a peace of death, for every living thing that ceases to prey will die of starvation.

Another error in imagination is the belief that because a man has a clever imagination along certain lines he must be clever along all other lines. This belief is popular, and particularly so in the mind of the clever and imaginative man himself; yet all human experience teaches the contrary. The inventor, who must be imaginative, is usually an "odd genius;" rarely is a great artist a man with enough judgment to make a good investment; and a gifted public speaker lacks the imagination to perceive that, if he is Secretary of State, it is bad taste to occupy the platform with Swiss yodlers. Henry Ford, who imagined how to make a remarkable piece of machinery, now imagines that he is "an angel of peace," indirectly propelled by gasoline, and that his judgment and ability in matters of statesmanship, finance, human endeavor, and war are superior to those of the world's greatest statesmen and diplomats who have devoted their lives to such themes, and he, therefore, further imagines that by the use of his few millions, which are a drop in the bucket compared to the daily costs of the belligerents, he can settle a world war. Such a type of unbridled imagination is at once pathetic and absurd.

Then we have that type of imagination in which this trait is utilized not to make things better, but to make them worse—the demagogue who imagines he is going to convert sensible men to the belief that he is a born leader of the race, and he who imagines that no one can differ from him and be sane or worthy of consideration. We meet the man who imagines that because all is not right, therefore everything must be wrong, and, not content with this view, also imagines it is his function in life to make other people equally pessimistic and perverse. These are the men that add to our burdens, who chant the hymn of *Dies Iræ*, when others would be singing songs of gladness, whose clear days are clouded by approaching storms, who imagine that each day might be better and that to-morrow will be worse. Such persons were described in gentle language by Elizabeth Barrett Browning, who wrote:

Methinks we do as fretful children do.
Leaning their faces on the window pane,
To sigh the glass dim with their own breath's stain
And shut the sky and landscape from their view.

Or, again, when she wrote:

We overstate the ills of life and take imagination
Given us to bring down the choirs of singing angels,
Overshown by God's clear glory, down on earth to rake
The dismal snow instead; flake after flake covering all the corn.

We walk upon the shadows across a level thrown,
And pant like climbers, near the alderbrake
We sigh so loud, the nightingale within
Refuses to sing loud as else she would.

Let us, then, have a well-controlled imag-

ination that adds to the joy of living for ourselves and others, always imagine that things will be better rather than worse, and if imagination seems to threaten our judgment, at least to think, before we push it aside as useless, how much worse things might have been rather than how bad they are. Let us not be like the lame boy in the Pied Piper of Hamlin, described so well by the other Browning, who all his life let his imagination, as to what his former crusaders were doing, make him miserable, although he lived, and his imagination should have shown them to be dead.

One was lame
And could not walk the whole of the way,
And in after years when they would blame his sadness
He was won't to say "it's dull in our town since my playmates left."
I can't but think that I am bereft of all the pleasant
Sights they see that the Pied Piper promised me.

Rather let us be as was Dr. E. L. Trudeau: he died only last month, optimistic to the end throughout forty years of a desperate struggle with tuberculosis, which gradually involved tissue after tissue, and which rarely failed to incapacitate him, for long periods, at moments when his imagination had led him to a spot just short of the goal of brilliant result. For Trudeau, stricken at the outset of his career, driven to the wilds of the Adirondacks, separated by space and communication from scientific life, aided science, aided humanity, and made a mark in the study of tuberculosis which no time can efface. Well do I remember how, more than twenty-five years ago, I was in a position whereby I was able to obtain from Koch a sample of his tuberculin, when his first publication as to its use appeared and the world was wild with the thought that a cure for this universal disease had been found. I shipped it to Trudeau, as the one man of all men on this hemisphere who ought to have it. Two days later I received a telegram: "Bottle broken, words fail." The extreme cold of the Adirondacks had frozen its contents and burst the glass while it was in transit.

In 1910 the Congress of American Physicians and Surgeons honored itself by having Trudeau as its President. When he gave his address he was too weak to be heard beyond the first few rows in the audience hall, yet those beyond his words strained their ears to listen, and there was intense silence, for his presence and spirit spoke in clarion notes, and everyone knew that there was to be seen the triumph of the spirit over the flesh. What was the surprise and delight of his audience when they found that the subject of his address was "Optimism in Medicine." His address ought to be read, and I read it each year to some of my students, to every class which is about to receive its degree. In it he used these words:

"Optimism is a product of a man's heart rather than of his head; and on that account is rather frowned upon by many physicians whose scientific training naturally leads them to depend solely upon the qualities of the intellect, and look with suspicion upon any product of the emotions. We doctors are too apt to look upon 'brains'—that is, a man's purely intellectual attainments—as the criterion of his chances for achievement in life, and to ignore and even deprecate those qualities which are closely related to his emotions as rather likely to mislead and hamper him in his career. And yet optimism is a prominent factor in anything a man may achieve in life. It is a mixture of faith and imagination, and from it springs the vision which leads him from the beaten paths, urges him to effort when obstacles block the way, and carries him finally to achievement, where pessimism can see only failure ahead. Optimism means energy, hardships, and achievement; pessimism, apathy, ease, and inaction. Optimism may, and often does, point to a road that is hard to travel, or to one that leads nowhere; but pessimism points to no road at all.

"I have come in contact with many men of splendid attainments and opportunities who, by habit and education, have suppressed imagination and faith until their usefulness has been greatly impaired, and who accomplished little in life because the chill of pessimism ran in their blood, and the *qui bono* was the early death-blow to

every impulse at accomplishment. Lack of faith and imagination has quenched achievement in many men whose intellectual attainments promised most fruitful careers.

"It is, perhaps, true that the great majority of physicians, outwardly at least, appear to incline neither to pessimism nor optimism, and seem merely to float with the tide, without aspirations or ideals; but in reality few of them, in the innermost recesses of their ego, are entirely free from some degree of imagination and faith which they habitually quench, and which, if cultivated, would at least broaden the sphere of their activities and make life less colorless."

And at the close of his address he added these additional words, well worthy of our memories:

"Optimism is the one thing that is within the reach of us all, no matter how meagre our intellectual equipment, how unpromising our outlook at the start, or how obscure and limited our careers may be. It was about my only asset when I built my first little sanitarium cottage on a remote hillside in an uninhabited and inaccessible region. Viewed from the pessimist's standpoint, that little cottage as an instrument of any importance in the warfare against tuberculosis must have appeared as a most absurd and monumental folly. Optimism made me indifferent to neglect and opposition, and blind to obstacles of all kinds during long years of struggle before the value of sanitarium treatment became generally recognized. It enabled me to undertake the culture of the tubercle bacillus and delve in the complex problems of infection and artificial immunization, though I had no knowledge whatever of bacteriology, no laboratory, no apparatus or books. It has steadily upheld my faith in the possibility of ultimately attaining to an immunizing treatment for tuberculosis, in spite of many discouragements and years of fruitless work.

"Optimism enabled me to assume for over a quarter of a century the financial support of my work, and though the little cottage grew to be a village, and the workroom in my house a well-equipped laboratory, though their support each year required large and increasing sums, these have ever been forthcoming.

"In a long life which has been lived daily in contact with patients beyond the reach of human skill, who through months and even years of hopeless illness looked to me for help, I have indeed had need of all the optimism I could cling to. It has ever been a precious asset to me, and I hope to those about me as well, and has never entirely failed me."

It may be well said that Trudeau gained his optimism through his imaginative power.

He closed his address with these words:

"As Stevenson says, if when age and infirmity overtake us 'we come not within sight of the castle of our dreams,' nevertheless all will be well with us; for 'to travel hopefully is better than to arrive, and the true success is in labor.' "

But, let me add that "true success is in labor" only when it is lighted by the lantern which is called "imagination," which can change the gray dawn of our beginning into the roseate sunset of our end.

THE NEWER ANTITOXIN TREATMENT OF DIPHTHERIA.

The *Lancet-Clinic* of June 12, 1915, contains an article on this topic by STAMMEL. He concludes as follows:

1. Do not be afraid to give what is considered a large dose of antitoxin, thus avoiding repetition of dose.

2. A child needs relatively more antitoxin than an adult. Duration of disease, extent and location of membrane, and degree of toxemia should be the guide to proper dose.

3. All croup cases which do not clear up under ordinary treatment in two to four hours should be considered diphtheritic, and treated as such. Do not wait for report on culture—give sufficient antitoxin immediately.

4. Chronic nasal discharge in children, which does not react to treatment, should be suspected, particularly if there be a serogangrenous discharge which excoriates the upper lip.

5. The earlier the proper treatment is instituted, the fewer will be the complications, and the lower will be the mortality.

EDITORIAL.

THE TREATMENT OF SUDDEN CARDIAC ARREST DURING OPERATIVE PROCEDURES.

From time to time we have called attention in the pages of the GAZETTE to the subject of resuscitation of the apparently dead by massage of the heart. Massage of the surface of the body over the heart has frequently been practiced, and a number of writers have asserted that this method has seemed to be potent in reëstablishing cardiac action. In other instances where sudden cardiac failure has developed during abdominal operations, massage of the heart through the diaphragm has resulted in resuscitation, and in some instances the surgeon, driven to desperate measures in the face of death, has incised the diaphragm, introduced his hand through the incision and applied direct cardiac massage, thereby succeeding in establishing renewed cardiac action.

So far as we know, little or nothing has been done to determine the effect of injecting cardiac stimulants into the pericardial sac with the idea of bringing them in direct contact with the failing, or arrested, heart, and when the circulation has ceased to such an extent that there is no hope of an intravenous injection being carried to this viscus. We have, therefore, read with a good deal of interest the communication by Gunn and Martin in the *Journal of Pharmacology and Experimental Therapeutics* for July, 1915, in which they discuss intrapericardial medication and cardiac massage. In order that there might be no doubt that the drugs have entered the pericardium, and in order that their observation of the action of the heart might be accurate, they made an opening in the chest wall before giving the injection, and they found that atropine, pilocarpine, and adrenalin when injected into the pericardial sac in the rabbit rapidly produced very characteristic effects on this viscera, these effects being due to a local action and not to absorption of the drugs into the general circulation. We presume that digitalis acts so slowly that this method of employing it cannot be utilized with advantage in the presence of sudden cardiac failure when death is threatened.

So far as massage of the heart is concerned, they believe that the compression should be gradual, relaxation should be abrupt, and that the rate of compression should be less than half the normal cardiac rate. The massage should be interrupted at short intervals for a few seconds to allow spontaneous beats to develop. The effect of the massage is a double one, in that it empties the cavities of the heart, if they are engorged to such an extent as to be in danger of paralytic distention, and, secondly, massage acts as a mechanical stimulus to the heart muscle. They think that there are four ways in which cardiac massage can be practiced: First, by direct compression of the heart through an opening in the thoracic wall. This method is manifestly out of the question in human beings except under very rare circumstances, as, for example, in some major operation upon the left thorax. Second, by compression of the heart through an opening in the abdominal wall, which, as we have already pointed out, has been practiced in a considerable number of cases by surgeons operating on the organs of the abdominal cavity. Third, by simple compression of the abdomen as near the heart as possible; and fourth, by a similar compression of the thorax, which, as we have already said, has been frequently practiced, sometimes with favorable results, in cases of cardiac failure in human beings.

Gunn and Martin claim that direct thoracic massage combined with the intrapericardial injection of adrenalin can revive the heart in practically any case of chloroform poisoning in the rabbit, even though the treatment be not begun until fifteen minutes or more after the heart has completely ceased to beat. This is a very interesting and important statement, not only because it illustrates the fact that efforts at resusci-

tation should be continued for a long time after death seems inevitable, but also because it would seem to indicate also that chloroform when it arrests the heart does not act as a destructive cardiac poison, but simply interferes with function, and that this function is restored by adrenalin.

In the experiments made by Gunn and Martin they used for the purpose of resuscitation in animals artificial respiration through a tube in the trachea, intrapericardial injection of adrenalin, and massage through an opening in the abdomen.

After cardiac action is once reëstablished the feebleness of the circulation is to be still further overcome by the intravenous injection of either adrenalin or pituitrin.

While some of these measures seem heroic when applied to human beings, the presence of an otherwise inevitable death will probably make every surgeon feel that he is more than justified in meeting so grave an emergency by these measures, radical though they may be. Desperate conditions must be met by desperate measures, and, although these measures may fail in a large proportion of cases, the saving of human life occasionally by their institution justifies their performance, although care should be exercised that the condition of the patient is actually so grave that last-resort methods are justified.

THE TREATMENT OF DIABETES.

One of the difficulties which exist, in the treatment of this grave and obstinate condition, is that it is almost impossible to find a patient who is willing to take sufficient care in regard to the various aspects of his case to enable the physician to give the disease adequate study. The average patient thinks that when a diagnosis is made the treatment should begin at once and is restive at any delay, even if the physician explains to him that, after a diagnosis of diabetes is reached, each case must be studied for itself, because in every instance in which this disease occurs such variations take place that the treatment advisable for one man may be inadvisable for another.

It has long been recognized that although the presence of sugar in the urine is essential to the diagnosis of diabetes mellitus, nevertheless the amount of sugar is not necessarily a gauge as to the severity of the disease. Rapid loss of weight, marked thirst, intense hunger, and the development of so-called acidosis, are of much more importance from the diagnostic and prognostic standpoint. It is nevertheless important, in the treatment of every case, to determine the average amount of sugar which is passed in each twenty-four hours under the diet to which the patient has been accustomed, to gain some conception as to the amount of acetone and diacetic acid eliminated, and, more important, at least to have a qualitative determination of β-oxybutyric acid.

An examination of a single sample of urine representing the amount passed in twenty-four hours gives us no right to suppose that the quantities of sugar in other twenty-four-hour specimens are the same, and if the physician, relying upon such a single test, institutes treatment, medicinal or dietetic, he cannot conclude, a few days later, when the sugar is lessening or increasing in amount, that his therapeutic measures are responsible for the improvement. Furthermore, in many cases of diabetes it is essential that the patient shall be, to a greater or less extent, deprived of all starchy foods, and, it may be, on certain occasions subjected to a so-called "starvation day," during which he has nothing but green vegetables to allay his sense of hunger. To place a patient already suffering from a considerable degree of so-called acidosis upon a very limited diet, or upon one deprived of starch, is equivalent to inviting an attack of diabetic coma in some instances. To put the matter in a concrete form, the physician should not meddle with the complex problems involved as to metabolism in a case of diabetes mellitus until he has, to use a political phrase, obtained a clear idea of the complexion of the case. It is always the duty of the physician to help nature rather than to interfere with and impede her efforts, and if the body, utilizing its protec-

tive process in this disease to ward off disaster, is obstructed rather than helped, the physician ceases to be of assistance and does more harm than good.

Some time since we noticed in the columns devoted to book reviews a small book entitled "The Starvation Treatment of Diabetes," the plan being worked out by Dr. Frederick M. Allen. Of course, the starvation treatment of this malady, in one form or another, is by no means novel and has been practiced by many physicians for many years. The particular plan devised by Dr. Allen undoubtedly has done good in a considerable number of cases. That it is wise to follow it rigidly in all instances we seriously doubt. The plan is as follows:

For forty-eight hours after admission to the hospital the patient is kept on an ordinary diet to determine the severity of his diabetes. We think that this is too short a period, since our experience has shown that this determination can only be approximately made by a study covering from five days to a week. At the end of two days the patient is put to bed and no food allowed save whisky and black coffee, the whisky being given in the coffee, one ounce of whisky every two hours from 7 A.M. to 7 P.M.—in other words, six or eight ounces a day. Sodium bicarbonate is sometimes given in the dose of two drachms every three hours, if there is much evidence of acidosis, as indicated by strong acetone and diacetic reactions in the urine, or a strong acetone odor to the breath. It is stated, however, that in most cases this is not necessary and that there is no danger of producing coma by the starvation. If this is true it controverts the belief heretofore universally held by medical men, and until further evidence is adduced we prefer to remain on the side of caution by regarding suddenly induced starvation as dangerous. The patient is kept in bed and starved until the urine is sugar-free. It is stated that the disappearance of sugar is rapid. If there has been 5 or 6 per cent, after the first starvation day it goes down to 2 per cent, and on the third day the patient is sugar-free, or certainly by the end of the fourth day this occurs. It is claimed that there may be a slight loss of weight amounting, perhaps, to three or four pounds, and Allen goes so far as to say that a moderate loss of weight in most diabetics is to be desired. Here, again, we think that this statement is too dogmatic. It may be true of obese patients, but it certainly is not true of the emaciated ones, particularly if the patients are young. The question also arises as to how many patients are able to take nothing but alcohol with black coffee to the extent of 6 or 8 ounces a day with advantage. It may be true that the sedative effect of this amount of alcohol overcomes the nervous effect of large quantities of black coffee, but many diabetics suffer very intense nervous irritability, which is often emphasized by distressing pruritus, and we question whether this so-called diet would be tolerated, even if the liver and the stomach were able to deal with this amount of alcohol without distress. Certainly there are a very large number of persons who cannot take this amount of alcohol, even if it was diluted with a considerable quantity of food or drink, without inducing gastric and hepatic symptoms. When the patient is sugar-free he is allowed to get up and placed upon vegetables containing approximately 5 per cent of carbohydrate. These vegetables are thrice boiled with changes of water, so that their actual carbohydrate content is reduced probably one-half. A moderate amount of butter-fat is permitted. If the patient eats very heartily of green vegetables, even if they are thrice boiled, he may obtain more carbohydrate than his system can utilize. The typical dietary for the first day of feeding is as follows:

Breakfast.

String-beans, 4 heaping tablespoonfuls.
Asparagus, 4 heaping tablespoonfuls.
Tea or coffee.

Dinner.

Carrots, cooked, 2 heaping tablespoonfuls.
Spinach, cooked, 3 heaping tablespoonfuls.
Tea or coffee.

Supper.

Cucumbers, 12 slices.
Celery, 6 pieces about 6 inches long.
Tea or coffee.

In diet list No. 2 cabbage and onions are substituted for some of the vegetables

already named, and on the third and fourth day the variety of green vegetables is increased as to number and cream and butter added. The diet, day by day, becomes somewhat more generous, so that diet list No. 12 contains bacon, 2 slices 6 inches long, 1 egg, and 2 heaping tablespoonfuls of spinach, coffee, butter, and cream for breakfast.

Dinner.

Steak, one, very small.
Salt pork, 4 slices.
Cabbage, 3 heaping tablespoonfuls.
Onions, 3 heaping tablespoonfuls.
Butter, cream, and tea.

Supper.

1⅛ ounces of beef balls.
Celery salad, 2 tablespoonfuls; olive oil.
Tomatoes, 2½ tablespoonfuls.

In addition the patient is allowed during the day 2 ounces of butter and 10 tablespoonfuls of 40-per-cent cream. If, as the diet is gradually increased, sugar appears the diet is again cut down, and it is important to remember that the increase in the proteid elements of diet may increase the elimination of sugar.

We think that the average physician will find some difficulty in making his patients adhere to the rigid rules described above, but, for that matter, he usually finds it difficult to make his diabetic patients adhere to any rules. That Dr. Allen and his followers have been able to produce excellent results by this method is undeniable. That it can be applied in the sweeping manner which its description indicates we very much doubt. This plan of treatment savors too much of rigid routine applied in a disease which of all others lends itself but poorly to any absolutely hard and fast plan.

HOW DOES EMETINE ACT IN THE DESTRUCTION OF PARASITIC AMEBAE?

The fact that large doses of ipecac, if they can be retained in the stomach long enough to escape into the intestine, often exercise a specific influence in the treatment of certain forms of dysentery has been known to the medical profession for several generations, and long before any one suspected that dysentery was due to the presence of a parasite. In other words, we have here another interesting illustration of the fact that practical therapeutics is often far in advance of scientific investigation, and that clinical experience is often proved to be correct when science has advanced far enough to reveal the cause of a disease. The discovery of the entameba was the first step to prove that ipecac exercised its excellent effect by the destruction of this parasite, but it still remains to be determined as to the exact means by which this destruction is attained. The question naturally arises as to whether ipecac acts directly upon the parasite, or whether it induces, or produces, in the body some substance or condition which is unfavorable to its growth.

A very great advance in the treatment of dysentery of the amebic type was the discovery of Rogers that emetine hydrochloride, given hypodermically, failed to produce vomiting, as many people heretofore supposed it would do, and acted with greater efficiency than when crude ipecac itself was given by the mouth and without any of the disagreeable gastric effects of the crude drug. As in all other instances where the human body is infected by a parasite it holds true in this case also that where the parasite is deeply embedded in the tissues it is more difficult to destroy it by ipecac or emetine than where it is free in the alimentary canal, or exists in superficial ulcerations. One of the advantages of the hypodermic use of emetine is that through the circulation the drug can reach amebæ which would otherwise escape if ipecac were given by the mouth, but even when emetine is so used, amebæ which are deeply situated and surrounded by protective barriers of lymph, or half-organized tissue, naturally escape from the destructive influence of the drug.

In the *American Journal of the Medical Sciences* for July, 1915, Lyons published a paper of great interest in this connection. Taking up first of all the question as to whether ipecac given by the mouth can thoroughly permeate the intestinal contents, Lyons points out that we practically have

no knowledge as to how ipecac or its active principles are eliminated from the body, although, of course, it is a fair supposition that most of the ipecac escapes through the rectum. Lyons made an interesting experiment, taking the stools of previously infected patients who had been treated by ipecac, but whose stools had within a few days been free from this parasite, sterilizing the stools by heat, and then adding to them living amebæ. The result was that the parasites added were not affected, apparently proving that the stool did not contain ipecac, or its principles which are destructive to the parasite. The question remains as to whether the heating destroyed the active agent, or if the active agent had been absorbed from the intestine so that the stool contained none of it. The former proposition would seem to be correct, because, as Lyons says, other experiments have shown that amebæ which are exposed to emetine or ipecac after expulsion from the bowel are promptly destroyed.

Something may be said as to the dose of emetine which should be given and the length of time that the treatment should be continued. It will be recalled that in Roger's work he used comparatively small doses, his average being approximately ⅓ grain, and a cure in most of the cases being achieved after 2 grains had been used. Others have, however, given as much as from 2 to 4 grains per day by hypodermic injection. In all probability one grain a day is quite sufficient for the average case, although much variation in dosage, as in all other conditions of disease, must occur. Lyons states that he has yet to see a case that required more than 2 grains daily, provided the principle of repeated small injections was followed. In any event the injections should be continued for four or five days after the stools are negative when examined for the parasite. Lyons also thinks that very large doses of emetine continued over a long period of time may induce diarrhea, which may be attributed to the microörganism, when in reality it is due to the drug. He also thinks that during the administration of emetine the moderate administration of a saline is often beneficial, doubtless sweeping out of the intestine the parasites which have not been killed but only rendered inactive by the drug. Aside from the diarrhea induced when emetine is given hypodermically or by the mouth, Lyons states that mild peripheral neuritis may occur, and quotes Eshleman as reporting a case which developed a general eruption, purpuric in character, associated with severe peripheral neuritis. Other cases of peripheral neuritis are also on record.

Finally, summarizing his paper, Lyons believes that when ipecac and emetine are used they act through absorption into the blood stream and exert their specific effect on those parasites which are within reach of the circulation—that is, in the tissues. The parasites in the lumen of the gut are apparently not affected by either oral or subcutaneous use of these drugs. This is not a very important matter, because the free moving parasites which are not situated in the pathological lesions, while capable of doing harm, are not actively engaged in damaging the patient. Lyons also thinks that the oral administration of emetine is not advisable because of the intestinal irritation that it induces. If the patient is to be treated by drugs administered orally ipecac should be employed. To prevent relapse a course of hypodermic treatments should be given occasionally.

THE TREATMENT OF ENLARGED GLANDS IN THE NECK.

Older practitioners will remember that twenty-five or thirty years ago cervical glands were very commonly met with in children and in young adults, and many of the older generation at that time bore the scars which indicated that in earlier years they had suffered from lesions in these lymph nodes. At this time, before the clear relationship between infection and enlargement of these glands was thoroughly understood, they received comparatively little attention, so-called absorbent ointments being rubbed in over them, or if suppuration occurred the enlarged gland or glands were incised as would be an ordinary

abscess. A little later it became apparent that in a very considerable proportion of these cases these glands were enlarged as the result of tuberculosis, and with this discovery many surgeons insisted that the proper way to treat such cases was to cut down upon these glands and carefully dissect out the entire chain. As time went on it became increasingly evident that a goodly proportion of these cases were not tuberculous, but arose from some other infection of the tonsils, or about decayed teeth, and this discovery materially modified the view of those who had been most strenuous in advocating extirpation in all cases. Another step forward was reached when the profession recognized that in many of these instances complete excision and dissection of these glands was capable of resulting in much harm, in that it exposed the patient to a more or less rapid spread of tuberculous infection even if the glands which were not seriously diseased were excised along with their badly damaged fellows. At the present time the old dictum that these glands ought to be removed has been replaced by a good deal of caution in the operative method of dealing with them, and it is also fair to state that the internal use of drugs and the external use of ointments do not receive the credit which was at one time given. The only routine or standard method of treatment may be said to be the elimination of the primary focus of infection, and then the upbuilding of the patient's general vitality by an outdoor life, syrup of the iodide of iron and other tonics.

Our readers will recall that some time since we called attention to the fact that the sudden disappearance of marked swelling in the neck in these cases was not to be a subject of congratulation, but of alarm, as indicating that rupture of suppurating lymph nodes had occurred and that the pus was burrowing into adjacent tissues.

In the *Medical Record* of July 10, 1915, Meyer wrote an interesting article upon this subject, stating that in the Division of Child Hygiene of the Boston Board of Health for 1913 there were reported 13,711 cases of enlarged cervical glands among 118,781 schoolchildren, or about 12 per cent, which indicates the relative frequency of this condition amongst the lower and middle class chiefly. As Meyer points out, however, an important part of this report is the statement that all but 2 per cent of these cases subsided without operation. When suppuration is recognized as being present by fluctuation, the universal rule that pus should be evacuated holds true and the entire gland or glands should be incised. This was the practice thirty years ago. The abscess should be kept open and permitted to drain, and, if necessary, it may be packed with a small piece of iodoform gauze, swabbing out with tincture of iodine, and filled with bismuth paste or a 5-per-cent emulsion of iodoform in oil.

Considering the question as to how many of these cases of enlarged glands are tuberculous in nature, Meyer finds that most authors give from 30 to 60 per cent.

Meyer does not wish to be considered too conservative, but believes that something should be said against universal operation, although he recognizes that there are some instances of marked breaking down in which as radical an operation is to be performed as if the surgeon were dealing with a malignant growth. It is, however, important in these cases to search for the primary cause, as we have already intimated, and remove it.

HEMOTHORAX.

The term hemothorax to the surgeon implies an effusion of blood in the pleural cavity, usually incident to trauma, though the leakage or the burst of an aneurismal sac may cause a hemorrhage as extensive and even more rapidly fatal, whilst the serous effusion secondary to malignant involvement of the pleura is habitually blood-stained, even if it does not contain a large admixture of blood.

It should be remembered that the pleura encloses a potential cavity of such capacity as to allow of fatal bleeding; that the signs of hemothorax are those of hemorrhage plus a rapidly increasing effusion into the pleural sac.

The profession is divided in its opinion as to the advisability of operation or conservatism, unless the hemorrhage and pressure are so pronounced as to constitute an immediate danger to life. Bradford and Elliott *(British Journal of Surgery,* October, 1915) note that the two main questions which arise when a medical officer has to deal with a man who has been wounded in the chest are as to the danger of prolonged bleeding and sepsis. In the South African war, where the conservative methods of treatment were adopted, the infection of the hemothorax was a rarity, Makins stating that during the whole campaign he saw only a single case of primary empyema, and this was one which he attributed to infection introduced by an early operation for the removal of a bullet as it lay beneath the skin. Some secondary empyemata were supposed to have been caused by aspiration. It was the general belief at the time that aspiration was useless in addition to being dangerous. When the rib was resected for evacuation of the blood secondary infection was certain. It was then decided that chest wounds were best left to the natural processes of cure; and the cases recovered well.

The present campaign in Flanders has changed this teaching. Hemorrhage would appear to be and sepsis undoubtedly is a much more serious matter in the prognosis of chest wounds than it was in the South African campaign. Post-mortem examination was carried on in 84 bodies with chest wounds, in 69 of which there was a blood-effusion. Of these 46 died simply from hemothorax, the effusion being infected in 38 of this number, and death in every one of these having been caused by the infection. Simple hemorrhage was certainly the cause of death in only one man who died on the third day, and perhaps in seven others where the evidence was incomplete. Many of these 46 men succumbed within the first week of their injury.

From this it seems that death from simple hemorrhage is not to be feared if the patient has survived to the third day.

There were 328 cases of hemothorax seen during life; 211 were sterile, and 89 of these were so large as to need aspiration; 117 were septic. Death occurred in 47 cases, of which 36 were septic. Only in two deaths was simple hemorrhage the cause. Infection, therefore, was present in roughly one-third of the cases recorded, and the large effusions were just as often septic as sterile. Infection was found in 25 per cent, and the total mortality for all cases was 10 per cent; 70 per cent died from sepsis, 5 per cent from simple hemorrhage, and the rest from sundry complications. This death-rate applies only to hemothorax, and it represents the incidence in a group of base hospitals to which the severest cases tended to be sent. In the casualty clearing stations nearer the front an almost identical mortality of 10 per cent was recorded, but this is the death-rate of all wounds of the chest, and covers the mortality in the first few days after the wound. It may be presumed that simple hemorrhage, the chief cause of death on the field, also claimed a share of the 10 per cent who died near the front, and in the 10-per-cent mortality of the survivors who passed through the casualty stations and reached the base, hemorrhage was negligible and sepsis took its place as the chief danger to be feared.

The chance of infection has therefore to be considered in every case of hemothorax. It may develop as acutely as an infective peritonitis, and with almost as rapid a movement to a fatal end.

Hemoptysis cannot be relied upon as a token of the source of the hemothorax, for it may be merely a result of a bruise of the lung from an extrapleural wound; or on the other hand it may be absent in some cases in which the lung is wounded. The track of the missile through the lung rarely shows much laceration, but there is considerable infarction around it. The bleeding is in all probability fairly rapid, though not often so abundant as to cause faintness in the cases that survive it. The leakage soon comes to an end.

The material removed by aspiration from a sterile hemothorax at any time from the fourth day onward may be a brownish-red fluid, which yields a light gelatinous clot *in vitro* on standing, and contains lymphocytes

and endothelial cells; a deep-red fluid exactly like non-clotted blood, which throws down a very heavy deposit of ordinary red cells on standing, and may fail to give even the slightest of clot *in vitro;* masses of soft, blackish clot, like jelly, which soon block the needle.

It appears probable that clotting takes place always and very early through the action on the blood of the ferment liberated at the surface of the wounded tissues. The clot may be complete and massive, or massive with an early and extensive separation of the yellow serum, from which respiratory movements may whip out the fibrin in layers which cover the pleural surface, while the serum contains most of the red corpuscles in suspension as seen in defibrinated test-tubes. The pleura reacts to the presence of the blood by a mild inflammation. If a clot forms it tends to lie in masses at the back of the chest and along the paravertebral recess. The lung itself is collapsed by pressure where it dips into the hemothorax. Above this it is overdistended and emphysematous, so that the upper lobe may actually encroach across the middle line of the chest as the whole mediastinum is displaced laterally by the increase of intrapleural pressure due to the effusion. The largest effusions—from 70 to 90 ounces—usually cause complete collapse of the entire lung against its root. Subcutaneous emphysema is fairly common in the penetrating wounds. In the total series of cases only eight indubitable examples of pneumothorax were encountered. Only four cases of pneumothorax without hemothorax were seen.

As physical signs, there are impaired movements of the chest on the afflicted side. The area of stomachic resonance extends unusually high. There is an atonic condition of the diaphragm and the heart is displaced away from the effusion. The percussion note is dull and high-pitched over the effusion. Above this, over the emphysematous upper area of the lung, the note is often of a lower pitch and more tympanitic than over the corresponding area of the lung on the other side, this Skodaic resonance being at times exaggerated to a surprising degree. Subcutaneous emphysema may be felt on palpation, and it introduces a very tympanitic note on percussion which completely masks the condition of the deeper strata. Tactile fremitus is abolished over an area slightly less than that of the dulness on percussion. Breath sounds are weak, but sometimes tubular sounds from the collapsed lung within a hemothorax are so loud and clear as to suggest, quite wrongly, that the lung is close to the thoracic wall. Vocal resonance is always changed. The buzz is lost over the fluid, but there may be bronchophony and whispering pectoriloquy, while ægophony is frequently heard in areas which change from day to day.

At the moment of the wound the soldier often feels completely winded, and this distress is succeeded by a dyspnea which lasts for two or three days, or as long as there is a large effusion within the chest. Hemoptysis is fairly abundant. For the first few days the temperature goes up even to 104°. In the majority of cases it soon drops to nearly normal, or oscillates from 98° to 100° for the next week or two. The tongue is clean or lightly furred. The patient rarely shows blanching, though a faint icterus may appear at the end of the first week. Even the large effusions do not prevent the patient from breathing with fair ease in the recumbent posture. Sterile hemothorax may disable a patient by prolonged fever, by dyspnea, or by a progressive collapse of the chest wall on the affected side. Absorption is slow. Hence free fluid should be removed by aspiration in all cases of effusion which exceed 20 or 30 ounces—that is, roughly, those in which the dulness reaches half-way up the scapula. This results in prompt disappearance of fever, easier breathing, and the return of mobility of the chest in a few weeks. Out of 89 sterile effusions aspirated, an average of three pints in a volume, there was no evidence of later hemorrhage or of any gross reaccumulation of fluid; only in one instance did an empyema develop afterward. The seventh to tenth day is a convenient time to choose for aspiration provided the fresh hemoptysis has ceased.

There are no physical signs known which will serve to indicate whether the blood is congealed in a massive clot that will render aspiration fruitless, or whether the serum is satisfactorily separated. The massive clot is uncommon. The needle should be introduced well forward in the axilla at the anterior limit of the effusion, and high up on account of the elevated position of the diaphragm. The fluid should always be subject to bacteriological study. Too rapid withdrawal of the fluid often causes considerable distress of the patient from a violent fit of coughing. As soon as discomfort is noted oxygen should be introduced. By alternately aspirating the fluid and injecting oxygen, it is possible to empty a chest of all the fluid without causing pain. This oxygen is absorbed in the course of a fortnight. The simplest of apparatus without a manometer will suffice; and the gas is adequately sterilized by passage through a bacterial trap formed by three narrow loops on an open glass tube, the inner surface of which remains wet after boiling. Under ordinary careful asepsis the process for aspiration will never infect a hemothorax.

As to the septic cases, pneumococcus, micrococcus tetragenus, and bacillus influenzæ were found in about 20 per cent of the cases. The remainder had all been infected from the skin or from fragments of clothing carried in by the missile. These external infections fell into two main groups, those due to the streptococci, and those due to anaerobic gas-producing bacilli of fecal origin. The latter, either pure or mixed with cocci, were found in nearly half of the infected cases, and their presence is responsible for a very characteristic clinical picture.

The diagnosis of this infection depends entirely upon the result of exploratory puncture. The fever develops progressively, or is sustained at a steady high level, or exhibits widely irregular excursions of temperature. The pulse is rapid, but not invariably so; the dyspnea is out of proportion to the physical signs and increases instead of diminishing. There may be furred tongue, sleeplessness; mild delirium marks a grave and usually hopeless infection. There develop pain and tenderness in the side as the pleural inflammation develops. There is often vomiting and a contralateral dry pleurisy or a pericarditis. Indeed, every case of hemothorax in which the condition has not definitely improved by the fourth day after the wound should be regarded as probably infected. Fluid withdrawn by aspiration will give an extremely offensive odor, like that of rotten eggs or feces, which is invariably due to the presence of anaerobic gas-producing bacilli. The detection of organisms is accomplished either in a direct film or on culture. These may be found, though the fluid resembles perfectly sweet blood; and indeed the worst streptococcic cases generally yield in the early days a fluid of a rich red color, owing to extreme hemolysis of the red cells. In nearly 20 per cent of the gas-bacillus infection the bacteriological report on the first sample of fluid, removed on the fifth or sixth day, was that it was sterile. Not all these cases appear clinically to be septic, and a second exploration three or four days later found, as a rule, abundant infection.

As to treatment, early recognition of the infection is of vital importance. The chest should be opened as soon as infection is proven. This is particularly true when streptococcic, staphylococcic, influenzal, or anaerobic infection is present. Resection of a rib yields fairly good results. As far as traced all the patients recovered after this treatment. The more extensive operations for chronic empyema have not been required. In case of gross mixed infection with abundantly purulent effusion a large drainage tube should be inserted and the results awaited. After a few days the cavity can be flushed out with hydrogen peroxide and some weak antiseptic. Wright's hypertonic saline tablets proved a failure. The authors hold that the grave symptoms shown in these cases are not so much of a toxic as of a mechanical nature. Owing to the rapid development of gas the patient rarely if ever exhibits the thready pulse, waxy yellow face, low temperature, and repeated vomiting which are seen in poisoning when a limb is the seat of severe

gas gangrene, and which almost invariably presage death. Staphylococcic infections also do well. Worst of all are the acute streptococcic cases.

This study is based on a large and recent experience. The authors say nothing of the immediate treatment of chest wounds, the checking of bleeding, which of course consists in the administration of morphine to quiet the patient, the strapping of the chest to put the region of injury at rest, the administration of serum to increase the coagulability of the blood and lessen the bleeding, and careful examination for the purpose of estimating at least roughly the source of the bleeding, and if possible getting at it and stopping it. Their figures are of interest as showing how rarely wound of the chest is fatal unless it be so almost immediately. The suggestion to aspirate for the relief of pressure seems entirely logical. Whether or not the teaching be sound the clinical experience is incontrovertible, and the deductions which are drawn from it are worthy at least of careful consideration.

CEREBROSPINAL FEVER.

Because of its comparative rarity little is generally known of infections classed under this title, either as to the origin and nature of the infection, its localization, its transmission, its prognosis, or finally its treatment. Benians *(The Practitioner,* November, 1915) notes that Weichselbaum identified the meningococcus of the now familiar type in 1887. He isolated this organism in some half-dozen sporadic cases, which were not associated with an epidemic of the disease; but continuing his researches for the next eight years he entirely failed to isolate this organism again. In 1895 the diplococcus Crassus was found presenting some characteristics similar to those of the meningococcus, not the least important of which is its capacity for appearing in the meningeal system from time to time. Gram-negative cocci have been obtained from the meninges, but showing marked cultural and morphological variations from the meningococcus of Weichselbaum, as well as cocci morphologically similar to the meningococcus, but differing in their reaction on sugar-containing media, and in their reaction toward Gram's stain, to which some of the cocci gave a positive and some a negative reaction. In addition to this, the presence of Gram-negative bacilli, bearing no clear relation to the coli-typhoid group of organisms, has very frequently been observed. And, finally, it must be added that it is by no means uncommon for a careful examination, both by films and cultures, to fail in demonstrating either the meningococcus or any other organism in the purulent cerebrospinal fluid; and this, too, in a characteristic case of meningitis occurring in an epidemic, when meningococci may be present in the pharynx.

None the less the meningococcus of Weichselbaum is usually recognized as the cause of cerebrospinal fever, anything else obtained from cultures being discarded as irrelevant. There is undoubtedly a fairly constant association of the meningococcus in the disease. The meningococcus for culture must be kept moist, warm, and must be planted in a richly albuminous medium. In cultures it varies markedly in size, large giant forms being fairly constant. All forms are Gram-negative. It survives but a very short time in artificial media. The effect of organisms on laboratory animals is slight and relatively inconstant so far as toxic action is concerned. Moreover, in order to cause meningitis, it is necessary that the organism should be artificially introduced into the meninges. It then causes an acute inflammation. It is true that most organisms act in the same way.

Benians recognizes three types of symptoms incident to a meningococcus infection: The catarrhal type, in which there is a localized infection of the pharynx; the septicemic type, in which there is usually a generalized infection of the body through the blood; the meningitic type, in which there is a specialized infection of the meningeal system.

In the catarrhal form there is usually a definite acute pharyngitis of a dry type —in the first instance of a streptococcic

infection, though subsequently the meningococcus is found in great numbers, especially in the nasopharynx adjacent to the sphenoidal air sinuses. The catarrhal type usually clears up promptly, excepting it goes into another type. Exceptionally it persists in a chronic form and the patient becomes a carrier.

The septicemic type is almost always preceded by the local pharyngeal infection. There is often erythematous rash or herpes facialis.

In the meningitic type the symptoms in the diffuse cases are those of a diffuse cerebrospinal meningitis, but in chronic cases principally those of a posterior basic infection. It is accepted that if a person who has been exposed to infection is not at the end of a fortnight harboring the meningococcus in his throat, he may be regarded as safe.

The meningococcus can as a rule be isolated from the throat in the early days of the acute disease. This is usually not possible by the end of the third week. Hence throat examinations are a tolerably safe means of diagnosis in early cases and in conditions in which lumbar puncture is not indicated. Apparently healthy persons who have been in contact with the disease from whose throats the meningococcus has been isolated may become carriers. The percentage of carriers has varied in different epidemics from 2 up to 40 per cent of those brought in contact with the patient. The carriers are regarded as temporary, periodic, and permanent. The temporary are those in which the infection persists for only a few weeks. In the permanent carriers the organisms may be present in the pharynx in great numbers for many months despite energetic and continuous efforts to eradicate them. In an epidemic there is a rising virulence, so each succeeding cerebrospinal fever patient is found to be associated with an increasingly large number of carriers. The virulence of the organism increases in its passage from victim to victim, and the organism acquires at the same time the power of implanting itself more readily in the mucosa of the normal individual's throat. It is rare for a known established carrier to become affected with acute cerebrospinal fever, due doubtless to the immunity set up during the course of infection. Moreover, there is a general belief that the primary contact, by which is meant the person in direct contact with the cerebrospinal fever patient, is rarely attacked by the disease. On the other hand, it is said to be the secondary contact—that is, the one coming in contact with the carrier—who is liable to become affected with the acute disease. This is an impression rather than a matter of fact established by careful statistical study. Examination of the citrated blood in a few cases has demonstrated the presence of typical meningococci. Moreover, they remain there for but a short period, and in a large number of clinically acute septicemic cases their presence cannot be demonstrated at all.

Various bacteria have been obtained from the cerebrospinal fluid. The important one is the meningococcus of Weichselbaum. They may be very abundant or found with great difficulty, or found not at all. They are more constantly found in the first tappings and tend to disappear later on. They readily undergo autolysis, this being the explanation of the fact that only a very few may be found in cases of pronounced purulent meningitis.

As to the transmission of the disease, starting with the assumption that an entrance is effected by means of the mucosa of the pharynx, though it is possible that the route may be direct incident to obstruction of the sphenoidal air sinus, it is more commonly carried by the blood. The filtering mechanism that separates the vascular system from the meningeal system is so fine that even the large albuminous molecules in the blood-plasma cannot pass across to the cerebrospinal fluid. Hence it is difficult to account for the passage into the thecal space of the meningococcus, which is a fairly large organism. Hort suggests that the meningococcus may exist in other forms than that in which we know it, and that in some one of its forms it may be sufficiently minute to pass through the filter. The examination of the cerebrospinal

fluid in acute meningitis shows the presence of a large amount of albuminous matter which steadily diminishes as the disease passes to a favorable termination. The number of organisms found at the first examination is no guide as to the severity of the attack. Polymorphonuclear leucocytosis indicates an acute inflammation. It subsides, the cells diminish, and there is a corresponding increase in the number of lymphocytes, this being regarded as a favorable sign.

The best means of treatment is the immediate and repeated injection into the spinal theca of a reliable antimeningococcal serum, following the withdrawal of a considerable amount of the excessive fluid through the cannula. The diminution in the number of bacteria, together with a lessening of the amount of albuminous substance, and an alteration in the type of cell present, will probably be found to have taken place within a few days.

The antimeningococcal serum has both antitoxic and antibacterial properties, and is usually standardized by an estimation of its phagocytic properties. The favorable action of the serum is not constant, and in some refractory cases, as for instance where an organism slightly different from the meningococcus, and known as the parameningococcus, has been isolated, the administration of an autogenous serum has resulted in a cure.

Meningococcal vaccines alone are not indicated since there seems to be little necessity for the production of antibodies of the opsonic type, as well as because antibodies, produced in the tissues and circulating in the blood, have but very little chance of ever getting into the meningeal sac.

Benians suggests that an autogenous vaccine might be administered and that the patient's serum containing his own antibodies could subsequently be transferred to the spinal theca.

Cerebrospinal fever as observed clinically usually begins with headache, chill and vomiting, stiff neck with a retraction of the head, photophobia, and often strabismus. Spasm may or may not be present. Early delirium is usually followed by coma. Herpes and skin rash are common. There is a marked leucocytosis. Most of the fatal cases die in the first week. Convalescence is extremely slow and often complicated. As to the diagnostic signs aside from the Kernig, which should always be positive, lumbar puncture is the one on which reliance is placed. The death-rate in children varies greatly with different epidemics. The Flexner serum being a specific should be used only when the meningococcus is found; serum injections are repeated daily. For the meningitis due to other bacterial infections, if that incident to the bacillus of influenza be excepted, there is no specific serum, nor attempt at its preparation. Hence lumbar puncture repeated in accordance with pressure symptoms would seem to be indicated. The failure of this measure to relieve the symptoms and to cure is probably due to a half-hearted apprehension of a broad surgical principle—*i.e.*, always drain pus under tension.

REPORTS ON THERAPEUTIC PROGRESS.

HYPODERMIC INJECTIONS OF OXYGEN GAS IN THERAPEUTICS.

The *British Medical Journal* of June 5, 1915, reminds us that hypodermic injections of oxygen gas were used therapeutically for the first time in the year 1900 by Ewart and Domine, independently of each other. Soon afterwards Chabas and Domine obtained good results in certain infectious diseases. With the publication of F. Ramond's work began a series of clinical studies on the subject. Béraud's experimental and clinical work showed that hypodermic injections of oxygen enable animals to resist asphyxia better than animals not so treated; that they controlled carbon monoxide poisoning, stimulated cell activity, acted as antitoxic and anti-infectious agents, slowed the pulse, usually lowered temperature in fever, diminished cyanosis, led to euphoria and diuresis, and in chest affections rendered expectoration easier and more abundant. It appears from the extensive experience of these two writers, and numerous others, that hypodermic injections of oxygen have proved either very beneficial or curative in the following conditions: Toxic dyspneas—for example, uremia, with or without bronchitis or pulmonary edema, diabetic coma, the pulmonary complications of diabetes; in mechanical dyspneas of the respiratory tract as a useful adjuvant treatment; in asthma and the asthmatic dyspnea of aortic disease; in poisoning by carbon monoxide and dioxide, deleterious gases, and vapors of ether or chloroform; bronchitis, emphysema, bronchopneumonia, either lobular or lobar; massive pneumonia, empyema, pulmonary tuberculosis, both in early slight and later severe cases; pertussis, acute endocarditis (one case), typhoid fever; edema of the glottis or lungs, marked dyspnea with defective oxygenation as in cardiac and renal disease, asphyxia neonatorum, syncope, and electrocution.

Ramond successfully treated by this means two cases of Raynaud's local asphyxia. Dumarest used it in early gangrene of the foot due to arteritis, and found it very useful in a large number of cases of "frost-bite" in the war. Toulouse and Puillet record rapid cure in four cases of acute psychoses of the confusional type; marked mental improvement began on the first day of treatment, confusion and agitation giving place to lucidity and calm, with improved sleep and euphoria. Dardel records great benefit in nervous and mental disorders: sleep improved and became deep and natural; euphoria was constant; benefit occurred even in organic cerebral disease. His cases comprise neurasthenia, epilepsy, constitutional psychopathy with chronic depression, ideas of persecution with violent attacks of anger, circular insanity, chronic gastritis with obstinate insomnia, and catatonic dementia with remissions. Léger tried this therapy in three cases of tetanus, two of which were very severe, and seemed absolutely hopeless; they all recovered.

Dr. Howitt and Mr. Jones have reported in the *Canadian Medical Association Journal* (1914) the beneficial results from the subcutaneous injection of oxygen in the dyspnea of tuberculosis, in gas poisoning, pneumonia, edema of the lungs, bronchial asthma, and after operations. In making experiments with regard to tetanus a fresh culture of B. tetani was obtained from Parke, Davis & Company, and subcultures made from this in dextrose beef extract bouillon and dextrose beef extract agar, incubated under anaerobic conditions at 37° C. for three days, and kept later at room temperature. The cultures were shown to be virulent by inoculation experiments on a guinea-pig.

In the experiments oxygen was injected into the subcutaneous tissue through an aspirating needle fitted with a long rubber tube connected with the source of supply. In the first series of experiments four guinea-pigs were inoculated with B. tetani, and in the case of two sufficient oxygen was given to produce emphysema over an area 3 to 5 cm. in diameter in the surrounding parts. In the two control animals,

symptoms of tetanus were observed after thirty to thirty-six hours, and death occurred after forty-six and seventy-two hours. Of the two treated with oxygen one survived. In the other tetanic symptoms were observed after forty-four hours, and death occurred after eighty-four. In this series of experiments an eight-day bouillon culture was injected on the inner side of the right thigh.

In the second series agar plate cultures were used. The skin was punctured with a sterile instrument, and a platinum needle drawn through the surface growth of the culture was then inserted into the wound. In the two control animals symptoms of tetanus were observed in thirty-six and thirty-eight hours, and death occurred in fifty and sixty-six hours. In the animals treated by injection of oxygen after inoculation, symptoms of tetanus developed in one animal in fifty-one hours and in the other in ninety. The former died after seventy-two hours; the other seemed to be recovering apparently eight days after inoculation.

The authors consider that though the experiments are limited they justify the use of oxygen in tetanus in the manner indicated.

The earlier observers, and some of the later also, used a simple apparatus consisting merely of a rubber tube connected with an oxygen bag or cylinder and a Pravaz syringe; this apparatus has often worked well, but the method is not accurate. Ramond (1911) interposed the rubber ball of a thermocautery between the oxygen balloon and the needle; it allowed quicker injection, so that three liters of gas could be easily and safely injected within the space of a few minutes (! Ed.). Derose gives a description of a simple but satisfactory arrangement invented by Sapelier. The special "oxygenator" of Bayeux is praised by Brelet as portable and very accurate; the gas can be injected either slowly or quickly. A description of Martinet's oxygenator is given by Dardel. The rate of injection varies according to the nature of the case. As a general rule, urgent dyspneic conditions need fairly quick injection, but never so violent as to produce any marked pain. In chronic disorders, however, slow injection is desirable. Thus Gouget advises that each injection should take from five to twenty minutes, but never more than thirty. Dardel urges that the patient should lie down for at least half an hour after injection whenever possible. Some slight pain on pressure may be felt over the site of injection for several days, and pricking sensations are common. The swelling produced by the injection may reach within a minute to half the size of a football, and the subcutaneous crepitation may be felt digitally and heard on auscultation for one to three days.

The site of injection may be the interscapular region, outer part of thigh or abdomen, buttock, lumbar region, outer thigh, or outer abdomen. Injection near the thorax should be avoided, because it is hampering to auscultation by the subcutaneous emphysema that follows; and Gouget says that the emphysema produced, if the injection be made in the back, may spread to the neck or mediastinum, and so cause pain or respiratory embarrassment. Light massage favors the diffusion and absorption of the oxygen; sometimes the skin becomes rosy during injection and shows local hyperthermia. Ramond says that "a few Cc." are enough for a case of Raynaud's disease; but for a general asphyxia he uses two or three liters at each sitting, repeated several times daily according to the needs of the case. In pulmonary tuberculosis Bayeux seldom gives more than half a liter a day; in milder cases one injection in three days, in graver one daily (up to a liter), but always slowly. In nervous and mental cases Dardel used Ramond's minimum doses (300 to 500 Cc.).

The method is free from risk, and has never produced any bad effects. Probably the reason why oxygen has been so little used by hypodermic injection outside France and Switzerland is that gaseous embolism has been feared, but it has never been known to occur either in man or animals.

In conclusion, there are many diseases, accidents, and cases of poisoning in which the hypodermic injection of oxygen seems worthy of trial, such as apparent death by drowning, lightning stroke, all acute poisons that kill by asphyxia or coma; many acute exanthemata, especially early in their course; croupous pneumonia as soon as the diagnosis is made, for at this early stage the oxygen-combining power of the blood is probably but little diminished; anthrax, glanders, malignant diphtheria and septicemia, and snake-bite. It may also prove worthy of a place in the treatment of chronic diseases such as chlorosis and the incoercible vomiting of pregnancy, for inhalation of oxygen is sometimes beneficial in both these conditions. And it may yet find a place as an adjuvant in the treatment of pernicious anemia, marasmus in children, various visceral diseases, chronic alcoholism, syphilis and its sequelæ, subacute combined degeneration of the spinal cord, tabes, disseminated sclerosis, syringomyelia, and status epilepticus. [We doubt if oxygen gas possesses half of the powers here ascribed to it.—ED.]

EHRLICH'S RECENT MODIFICATION OF SALVARSAN.

The *British Medical Journal* of June 5, 1915, tells us that Professor Wechselmann of the Rudolf-Virchow Hospital in Berlin and Dr. G. L. Dreyfus of Frankfurt have recently published their experiences of sodium-salvarsan (salvarsan-natrium).

After discussing the defects of the original salvarsan and of the more soluble neosalvarsan, Wechselmann stated that he was provided a year and a half ago by Ehrlich with a new salvarsan preparation, 12,000 injections of which he had since given. He found it satisfactory in every respect, as it combined the advantages of the two earlier preparations with none of their failings. At first two preparations were tested, the only difference between them being the presence of "hyraldit" in the one. The other, No. 1206 A, had the same action as the first preparation, the chemical and physical properties of which were inferior. Ehrlich accordingly decided to introduce only No. 1206 A under the title of "salvarsan-natrium." This was a fine golden-yellow powder, which was easily soluble in water, and which on exposure to air acquired a dark-brown color, became almost insoluble, and increased toxicity. It contained the same proportion of arsenic, 20 per cent, as neosalvarsan, and the dosage was accordingly the same.

For more than a year the dosage of sodium-salvarsan ranged from 0.3 to 0.45 gramme. Later the dose was occasionally raised from 0.6 to 1 gramme, and though these larger doses caused but little discomfort, the smaller doses of 0.3 to 0.45 gramme were preferred for ambulatory treatment. In these quantities the drug was found to be absolutely atoxic, and the injections were not followed by the slightest reaction as a rule. After the first injection in florid syphilis the only reaction was an occasional slight rise of temperature, which was unaccompanied by any discomfort. Only in four cases did slight vasomotor phenomena, suggestive of anaphylaxis, occur; but two cases within a week showed a measly rash, and the preparation was accordingly considered unsuitable for subcutaneous injection. This method of administration was also contraindicated by occasional slight necrosis at the site of injection, due rather to the alkaline constituent of the preparation than to the salvarsan element in it. Being practically atoxic, the preparation could be given in cases of apoplexy, diabetes, and other diseases, including nephritis, so long as the functional activity of the kidneys was not much reduced.

Albuminuria was never provoked by the injections, nor increased in cases in which it already existed. From forty to fifty injections were given in each case over a considerable period, two or three injections being given every week. It was hoped that equally good results would be obtained by increasing the dosage and decreasing the number of injections. In early cases a total dose 4 to 6 grammes was sufficient,

practically without exception, to banish all the clinical signs, and in about 93 per cent to render Wassermann's and other syphilitic reactions negative. In cases of old standing the clinical results were also good, but Wassermann's reaction sometimes remained positive for a considerable period. As concentrated solutions were apt to cause not a little discomfort and vomiting, a dilution of 0.1 sodium-salvarsan to 10 of a 0.4-per-cent saline solution was usually given and found satisfactory. Though the drug was given by subcutaneous and intramuscular injections in some cases, it appears that the intravenous method of administration was generally preferred.

The account given by Dr. Dreyfus of sodium-salvarsan was also very favorable. He pointed out that sodium-salvarsan was chemically the same substance as old salvarsan when this had been rendered alkaline immediately before injection. In other words, it was old salvarsan modified so as to be as easily given as neosalvarsan. So atoxic was this preparation that in a series of 138 injections there was no rise of temperature above 37° C., and no subjective reaction. In a short editorial note, the *Münchener medizinische Wochenschrift* expresses the hope that, by this advance in salvarsan therapy, the ambulatory treatment of syphilis among soldiers on active service will be greatly facilitated. At present it appears that the difficulties of preparing and injecting solutions of salvarsan are a great hindrance to ambulatory treatment in the field.

THE PREVENTIVE TREATMENT OF CATARRHAL DEAFNESS.

YEARSLEY in the *Practitioner* for June, 1915, says the general line of treatment which seems to be adopted when a patient presents himself with early middle-ear catarrh is to have recourse at once to inflation by catheter or Politzer bag, and, so far as the nose is concerned, to be content with prescribing a nasal douche, a spray, or a snuff, with, perhaps, the addition of an occasional application of the galvanocautery to the turbinates. If the case is in an early stage, or has not yet progressed very far, the result is good. It is, however, good only for a time; relapse comes presently, and more inflation, more nasal douching, more cautery are tried, probably with less success. Relapse occurs in nine cases out of ten, for the cause has not been treated adequately. Often then only is serious correction of nasal abnormality attempted—when it is too late. Perhaps more enterprise is shown by direct local treatment of the nasopharynx, but unless the cause of the nasopharyngeal condition is carefully sought out and treated, ultimate failure is inevitable.

The proper course to pursue in dealing with these cases is: first, to make a complete physical and functional examination of the ear, so that its exact condition as regards tympanum, Eustachian tube, and hearing is recognized; secondly, to examine the nasopharynx and nasal cavities to ascertain their condition and causative relation to the affected ear or ears; and thirdly, to adapt treatment judiciously to the individual case, always bearing in mind that the removal of the cause is of paramount importance. A few words upon each of these three heads are necessary.

In examining the ear, the condition of the membrana tympani and of the Eustachian tube must be ascertained, but the results of functional testing by whispered and spoken speech and by tuning-forks are of equal if not of greater importance. Speech is the most useful test, not only from the point of view of prognosis, but for ascertaining the progress of the case during treatment. The writer's own experience goes to show that, so long as any whisper-hearing remains, the prognosis is encouraging, being better in direct proportion to the amount retained. As regards tuning-fork tests, if Rinne's reaction is negative only for low forks, especially if the disproportion between bone and air conduction is not very marked, prognosis is not bad. Another point in prognosis is the amount of loss of hearing by air for low tones. The smaller the reduction in low-tone hear-

ing, the better the prognosis. When the loss is up to and including the C 128 fork, Rinne is markedly negative or negative for both high and low forks (C 128 and C 512 are the best to use), and when the whisper can no longer be distinguished, prognosis is bad. The writer ignores, here, the presence or absence of paracusis Willisii, for he is speaking rather of the early stages of catarrhal middle-ear deafness. Moreover, the presence of this symptom means that both ears are seriously involved.

The second point concerns the examination of the nose and nasopharynx. The former should be inspected by anterior rhinoscopy, both without and with the use of cocaine and adrenalin. In no case should the routine examination of the nasal cavities under cocaine be omitted. It is sufficient gently to pass a wool-armed probe, dipped in a solution of equal parts of 10-per-cent cocaine and 1-in-1000 adrenalin, over the mucous membrane of the anterior half of each nasal chamber. This is more efficient and less haphazard than the use of the spray. By this means sufficient ischemia, without inconvenience to the patient, is obtained to insure a full inspection of any abnormality of the septum present, and by it alone can the existence of a posterior bony spur be detected in many cases.

The nasopharynx can be examined by means of the posterior rhinoscopic mirror or by an electric nasopharyngoscope. It is better to use the former instrument before the nose is placed under cocaine, for the condition of the posterior ends of the inferior turbinates and of the Eustachian cushions can better be ascertained. For the electric nasopharyngoscope, it is usually necessary to cocainize the lower part of the septum. The instrument the writer prefers to employ is that of Holmes, which is passed like a Eustachian catheter and can be used from one side. This reveals well the condition of the postnasal space, and by its means adhesions or growths in the ostium of the tube can be accurately observed.

Having ascertained with as much detail as possible the exact condition of the patient, including his general state of health, and especially that of his digestive and circulatory organs, then and then only can the question of treatment be considered. When the case is in an early stage and the prognosis is favorable, there can be no other course open than to remove the cause. There can and must be no half measures. When a well-marked spur or deflection is present, the use of nasal douching, sprays, snuffs, or the application of the cautery to the turbinates is merely playing with the case, and will lead eventually to disaster.

CONCERNING SPARTEINE SULPHATE BASED ON USE IN 305 CASES.

In the *Denver Medical Times* for June, 1915, EARP comes forward as a champion of a drug which some have thought valueless. He believes that sparteine seems capable of acting as a heart tonic without causing any untoward effects such as are witnessed in the use of some other agents, and more heart force and less frequency are recognized after sparteine has been used. Whether given hypodermically or per os it is evident that its physiological action is obtained by the larger doses, such as one to two and one-half grains. The small doses are worthless. No doubt those who have used the fractional doses have met with negative results. While it produces favorable action as an unirritating diuretic, yet the writer does not particularly advocate its use when such a remedy is called for—that is to say, if it is simply a diuretic that is needed and nothing more. In certain nephritic conditions sparteine may be indicated at times when one hesitates to use those of another group. The writer cannot now go into the details of blood-pressure to furnish further evidence of its adaptability.

Concerning therapy and pathology there has been much for physicians to unlearn during the past few years. Interpretations have often been based upon false premises, and on the other hand careful investigation of a scientific character has placed a rational foundation under many things for a time empirical. It is now known that

many cases of both nephritis and arteriosclerosis have a normal blood-pressure and below it, and Janowski has shown that while increased blood-pressure is a valuable symptom in arteriosclerosis, yet the serious cases are those in which there is a low blood-pressure because these have an impairment of nutrition of the myocardium and it is impossible to maintain a high blood-pressure. It is for this reason that we find in the long-standing cases of endocarditis, when the nutrition of the heart muscle is at low ebb, there is a weakening of this structure and necessarily a disturbance of compensation results. This is the ultimate outcome of nearly, if not all, cases of chronic endocarditis. The writer knows that in many cases sparteine can render aid. In November of last year the *Medical Record* editorially called attention to some things in which the past few years had wrought a change in opinion. In chronic nephritis there are two groups, in one of which the blood-pressure is normal, and in the other it is heightened.

The observation of Janowski together with the results of certain functional tests indicates that the old classification of the parenchymatous, the interstitial, and the mixed types of nephritis is no longer in accord with clinical facts.

Petty (*New York Medical Journal,* April 3, 1913) has shown by experiments upon human beings with every possible aid of mechanical invention, with accurate records, that sparteine not only does not depress the heart muscle of a human being, but on the contrary it acts as a positive and powerful tonic to it. This series of experiments were made as a refutation to certain conclusions of Wiggs, who had made deductions based upon animal experimentation and published in the *Old Dominion Journal of Medicine and Surgery,* May, 1914. The writer called attention in the *Indianapolis Medical Journal* for April, 1914, to some of the fallacious conclusions respecting digitalis which were based upon the results of animal experimentation. Lawrence in the *Boston Medical and Surgical Journal* made certain deductions from information obtained from the Massachusetts General Hospital, two of which are that "the effects of various drugs on the blood-pressure as determined on animals do not furnish reliable criteria for the administration of such drugs to man, since the effect may be quite different in the latter." The pressure-raising effect of digitalis noted in animals and in healthy individuals does not occur, as a rule, when the drug is administered to individuals suffering from cardiac decompensation.

While digitalis is frequently compared with sparteine it has an avenue of usefulness in part a departure from that of sparteine, and it is not germane to speak of one as a substitute for the other, nor is it necessary to favor one to the exclusion of the other. To take this position shows a lack of working acquaintance with either drug. With our present knowledge of therapy we cannot argue in favor of sparteine as against digitalis with a view that digitalis always raises the blood-pressure. We have only to call to mind the clinically proved statement of Janeway in the *New York Medical Journal* of May 23—that the dangerous increase of blood-pressure from digitalis as used in human beings is a superstition without any basis of clinical fact. The clinical application of this newer conception of digitalis was recently revised by Martinet (*La Presse Médicale*), who not only confirmed the observations of others, but found that injudiciously employed it could be used in a large proportion of cases to lower the blood-pressure.

Petty has made plain that sparteine should not be classed with digitalis or that it has similar effects upon the circulatory system.

While sparteine exerts equally as tonic an effect on the heart muscle as digitalis, its influence on the arterial system, especially on the arterial capillaries, is directly the reverse, digitalis being a vasoconstrictor and sparteine a vasodilator. By dilating the arterial capillaries it reduces the resistance against which the heart is called upon to propel the blood. It may be thus seen why it prevents myocardial and general exhaustion, favors heart nutrition and the increase of heart-tone. It has the advantage of acting quickly and is practically non-toxic.

PRURITUS.

In the *New York Medical Journal* of September 4, 1915, CUNNINGHAM points out that remedies for itching are frequently entirely different from remedies for the disease that causes the itching. Very often they will not cure the disease; but the cure of the disease will naturally cure the itching. The writer is often put to it to devise ways and means to check the itching while he is attempting the slower process of removing the cause. The method adopted will vary with the character of the provocation.

In senile pruritus he is confronted with a cause that cannot be removed. Palliation is the only resource, and it is for the most part utterly unsatisfactory. The skin is dry and keratotic. This nutritional disturbance is reflected in the terminal nerves. It is universal, although it may be especially distressing in hypersensitive locations. Against this implacable embitterer of the evening of life all the legions of antipruritics have been flung in vain—a fair test of the actual worth of any of them in the face of an ineradicable cause. So insignificant are their effects that we are forced to resort to nerve benumbing agents administered by mouth. Even the full relief from these is frequently denied us because the patients are at the time of life when such drugs are badly borne. Cannabis indica, gelsemium, and the coal-tar preparations are employed with extreme caution. Their danger "makes us rather bear those ills we have than fly to others that we know not of."

An acute eczema would naturally be managed in a different manner from a chronic eczema; an urticaria from a dermatitis herpetiformis; a lichen from a spinal reflex. It will not do to slap carbolic acid on the lot and let it go at that. Nowhere in the whole range of applied therapeutics is it more clearly shown that "one man's meat is another man's poison" than in the application of remedies to the skin. A dry skin will call for different measures from an oozing one, a thickened skin from a thinned one, a hyperesthetic skin from one of normal sensibility, the skin of the normally constructed individual from that of the fussy, fidgety introspective *ego ipse* hypochondriac.

Some of these separated considerations naturally and necessarily overlap. Some reference has already been made to remedies. The sovereign remedy in every pathological condition is the removal of the cause. The remedy for the inflammation from a foreign body in the eye is not an eye-wash, but the extraction of the foreign body. The remedy for the pain of a fractured leg is the realignment of the fragments that are poked into the surrounding tissues. The remedy for an itching dermatosis is the cure of the dermatosis. This is practicable sometimes, as in urticaria where an active cathartic eliminates the toxins from the intestinal tract; as in trade eczema when the patient can be made to stop the handling of irritating materials; as in lichen planus where the bold administration of bichloride of mercury will speedily influence the eruption. Where for physical or economic reasons the cause is irremovable, palliation must be attempted. There are such causes. Senility is one. Organic disease of the liver exciting pruritus ani is another. The fact that a man must eat even if he itches is another. Men cannot forsake their accustomed toil at will even to escape this evil. The dyer must dye, for it is the only way he has of living. When after a consideration of all the circumstances, we are driven to the necessity of attacking the symptom irrespective of its origin, what shall be the order of our going? First disabuse the mind of all illusions regarding the potentiality of all the warmly advocated antipruritics. Do not be unbalanced by a name, either of a man or of his remedy. Think out the individual case before one and attack it on a common-sense basis. It is true that one must be guided in some degree by the experience of others, as life is too short to learn everything at first hand. But one can digest the evidence they adduce; one can analyze it and try it by the fire of his own intelligence. If so many different things control itching on some occasions and fail utterly on others, the

rational inference is that (the testimony of the witnesses being unimpeachable) there must be some point of divergence between the methods making for and against success. This brings the writer to the last item in his summary.

We are agreed that the patient has been carefully studied with regard to his peculiarities, the character of his ailment, and the feasibility of removing the exciting cause, and that we are compelled to resort to the antipruritics in order to accord him a measure of relief. How shall we employ the agents that we may select? It is safe to say that if carbolic acid frequently fails, its actual antipruritic value must be low. Its success must be attributed to the combinations in which it is made up, and the thoroughness with which these are applied. These combinations are mull, pastes, salves, powders, and heavy lotions. Thoroughly applied, these afford protection from air, moisture, and accidental contacts. That is the secret of success in treating pruritus. That is the explanation of the success of so many different agents in the hands of so many different investigators. It is probable that any non-irritating substance carefully applied would have yielded the same results. The odoriferous element gets the credit, but it was the liberal use of the protecting mass that actually achieved the result. This too explains why hospital cases do better than private cases, and why private patients who are followed up do better than dispensary patients who use their remedies in a slipshod, careless, and incomplete manner. How often has the writer seen plain olive oil afford relief unobtainable by more elaborate medication! How dependable has he found compound wool-fat ointment, made up of nothing but boroglycerin, wool-fat, and petrolatum! How surprising has been the response to stearate of zinc, which gives an unctuous coating to the supersensitive skin and excludes air, moisture, and friction! A trial may be made of any of the so-called active agents high in favor among dermatologists, and it will be speedily ascertained that, the menstruum being liberally applied, the results will be entirely different from those of a meager application. And this will not be because more of the active agent is used (for the proportion remains the same in an ounce or a ton), but because one protects the parts with a bland buffer.

The action of lotions would seem, at first glance, to controvert the position assumed above. They are moist and do not exclude the air and do not protect the part to any great degree. Granted! But they act on the principle of refrigeration when they are clear, and upon the principle of refrigeration and the deposition of a protecting powder when they are heavy. Calamine and zinc lotion leaves an evenly distributed bland powder over the surface after the rose-water evaporates. The English augment the effectiveness of this formula by adding oil and styling it calamine and zinc liniment. It is a matter of nice discrimination when the lotion or the powder or the salve is most advantageous. If it cannot be determined in advance, it can be by a little careful experimentation. But always should it be remembered that the application must be generous.

THE TREATMENT OF ARTHRITIS.

SEABORN in the *Canadian Practitioner and Review* for September, 1915, believes that it is now well recognized that the focus of chronic suppuration must be removed. The tonsils, teeth, nasal fossæ, appendix, or prostate often contain this focus. In many cases, after most diligent search has been made to locate the focus and when the serum from the joint is negative, we may still find the offending organism by removing under most strict asepsis the lymphatic gland nearest to the joint, macerating it, and making a culture of the contained organisms. Then vaccines may be prepared and that used which gives the most characteristic reaction.

In two cases in which this was done the improvement was very great. In both staphylococcic and streptococcic vaccine had been used, and in one gonococcic vaccine as well.

The improvement after autogenous vaccines thus procured was very great.

THE COMPOSITION AND PREPARATION OF PROTEIN MILK.

In the *American Journal of Diseases of Children* for September, 1915, COURTNEY and FALES reporting on this topic say that the routine procedure followed in the hospital diet kitchen was as follows:

A quantity of whole milk, usually eight or ten liters, was heated to about 100° F., and into it was gently stirred for a moment one junket tablet, dissolved in a small amount of water, for each liter of milk. The milk was left standing, covered, at the temperature of the room, usually about 72° F., for thirty or forty minutes. It was then poured on two thicknesses of cheesecloth, by tilting which the curd was gently rolled from side to side and the whey drained away in the course of eight or ten minutes. Water was then poured on the curd and the manipulation repeated. This washing was done twice. The curd was then placed on a fine wire sieve, fifty meshes to the inch, and rubbed through it with a metal vegetable masher, with the gradual addition of one-half liter of buttermilk to each liter of whole milk used for the curd. Enough water was then added to make the volume equal to that of the original milk.

The chief variation in the composition of protein milk is in the fat. Uniformity is secured not only by the use of ingredients of uniform composition, but, what is much more important, by the exercise of great care in the handling of the curd. It should be suspended for a short time or allowed to rest for fifteen minutes on the sieve before manipulation to drain off the whey; care in pressing the curd through the sieve is also essential.

Since the value of protein milk is in a large measure due to its low sugar content, the washing of the curd with water is a useful means of removing an additional amount of sugar.

When properly prepared the amount of protein in protein milk is quite constant and is usually somewhat greater than that of the original milk; it is nearly all casein.

If the buttermilk is added while the curd is being rubbed through the sieve, it is unnecessary to repeat this part of the process.

In the ash of protein milk the amount of calcium and phosphorus is slightly greater; that of sodium, potassium, and chlorine is less than in whole milk, being reduced to a little more than one-half the proportion present.

Certain things are to be avoided in preparing protein milk: (1) stirring too much or too long while adding the rennin; (2) leaving the milk during curd formation in a cold place; (3) any unnecessary handling of the curd in straining off the whey or in washing or in pressing through the sieve; (4) subsequent heating beyond that required in feeding.

The composition of protein milk obtained from all their analyses when made as above described is: Fat, 3.0 to 3.50 per cent; sugar, 1.8 to 2.0; protein, 3.60 to 4.00; ash, 0.65.

ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

In the *British Medical Journal* of August 21, 1915, VROOMAN states that to draw conclusions from so limited a number of cases as he has had is somewhat dangerous, and it would be absolutely unfair to judge the merits of the treatment from the results obtained from eighteen cases. Of the first twelve of the series nine were failures, and only three showed a partial benefit. This was because they were long-standing cases, in which there was an absolutely bad prognosis anyway. To obtain good results one must, the writer is convinced, use this treatment in cases of recent origin.

The moderately advanced case of recent onset, with the disease confined almost altogether to one side, is the type of case in which pneumothorax should be produced at once. Many of these progress rapidly, and at the end of six months must be classified as far advanced, so that by the use of artificial pneumothorax we have a most valuable adjunct to our treatment. Incipient cases, with severe hemoptysis, should also be treated by pneumothorax at once. In so many of these there is such a rapid

extension of the disease after hemoptysis that it is better to give them the benefit of this treatment. The writer cannot go as far as some and advocate that all incipient unilateral cases be treated, as the results with ordinary sanatorium treatment are good. On the other hand, his experience does not encourage him to hope for much benefit from pneumothorax in the far-advanced, long-standing cases. He would distinguish here the far-advanced case which has recently become so, and that in which the disease has been of some years' standing.

A case of recent onset, which from physical signs must be classified as far advanced, but which from general condition is still moderately advanced, is eminently suited for pneumothorax, provided, of course, the disease is mostly unilateral.

Artificial pneumothorax is, then, a valuable addition to the methods of treating tuberculosis, but unfortunately its application is restricted to not more than 5 per cent of cases which have come under the writer's observation.

WHAT DO THE NEWER METHODS OF TREATMENT OFFER THE PATIENT WITH MALIGNANT DISEASE OF THE UTERUS?

CLARK in the *New York Medical Journal* of September 4, 1915, says that because of the great expense incident to the use of the radium treatment, attempts are being made in all countries to achieve as good results with the *x*-ray as could be secured from the more expensive form of therapy. Perhaps the most thorough report on this subject comes from Professor Bumm, of Berlin, who has endeavored to perfect a method of treatment by the use of the *x*-ray. He believes that eventually the Roentgen ray will prove a very effective substitute; indeed, he is inclined to predict that this latter agent will supersede radium in the treatment of uterine carcinomata. In his opinion a technique will be evolved to permit of satisfactory treatment with the *x*-ray, without resulting serious burns of normal tissue. He even makes the startling assertion that, with the use of the newer tubes, it may be possible ultimately to reach these cases without the necessity for employing vaginal treatment. In order to prove his theory, Bumm subjected six women suffering from advanced carcinoma of the cervix, in all of whom large, fungoid, freely bleeding masses completely filled the vaginal vault, solely to radiation from the abdomen or back. In all these cases the tumor disappeared completely within a few weeks. Specimens of tissue excised for microscopic examination showed almost complete destruction of the carcinoma cells, only a few scattered, degenerating remains being found, and these surrounded by dense masses of fibrous tissue. In one instance no cancer cells were demonstrated.

From these experiments Bumm believes that many deeply seated growths hitherto regarded as of unfavorable prognosis may be offered a hope of cure by the use of the *x*-ray. The technique must be very carefully carried out, however; moreover, the method requires time and is costly, facts that must be recognized by physician and patient. This observer draws attention to the fact that in many instances considerable irritation of the skin is bound to result, and this may even go on to the formation of blisters. This dermal condition, he states, will rapidly disappear under local treatment, and in his opinion is a very slight objection when compared with the ultimate cure of an otherwise hopeless malignant growth.

Out of the mass of literature reviewed by Clark, he arrives at the inevitable conclusion that the *x*-ray in these large doses must possess harmful effects upon normal tissues, and prove an actual danger from deeply seated burns. Krönig, one of the most enthusiastic exponents of the use of mesothorium and radium, does not aver that a single cure of cancer in which there were deeply seated metastases has been effected.

Basing his statements upon the literature and upon his own limited experience in the use of radium, Clark would set down as definite postulates the following conclusions:

1. Up to the present there is not suffi-

cient evidence in favor of radium to justify one in using it as a substitute for surgical measures in operable cases.

2. As a forerunner to and a follower up of an operation, it is unquestionably advisable.

3. In inoperable cases it should invariably be tried, for apparent cures have occurred in some markedly advanced cases, and in those cases that are not ultimately cured there is, nevertheless, a decided amelioration of symptoms—in many instances the offensive discharge and hemorrhage completely disappear.

4. A serious disadvantage in the use of radium is that it occasionally produces a wide-spread necrosis, leaving vesical and rectal fistulæ in the wake of its destructive action. This, however, usually occurs only in advanced cases of carcinoma, and need not therefore deter one from the use of the remedy.

From time to time chemical means for the cure of cancer have been advocated. Thus far, however, no measure has proved of sufficient value to be accorded more than a temporary place in the literature, and therefore this subject may be dismissed without further discussion.

The treatment of carcinoma by cancer extracts and various serums has also proved to be worse than valueless.

In this country a very ardent advocate of desiccating heat for the cure of carcinoma is Percy, of Galesburg, Illinois. This investigator is of the opinion that experimental work has proved that cancer cells may be destroyed when the temperature of the affected part is raised to between 50° and 55° C. For the purpose of applying heat to inoperable carcinoma masses he uses a "cold cautery" at a comparatively low degree of heat for a sufficient length of time to destroy not only the superficial but also the deeply seated growths. He has not as yet published a report of a definite series of cases treated by this method, and thus far his experiments have been conducted largely upon a theoretical basis. He maintains that he has had most remarkable results in individual cases, but as these are but isolated examples it seems that no proper estimate of this plan of treatment can be made until a carefully detailed study of the cases is presented. In justice to Percy, however, it must be said that the majority of surgeons in the United States who have attempted to use his method have started in on the assumption that he employs cauterizing heat. He protests very strongly against this use of his cautery, and prefers to speak of it as a "cold cautery." The iron should not, he declares, be hot enough to scorch a pledget of white cotton kept in contact with it for even half an hour. No smoke or odor of burning tissue should accompany its use. In the hands of skilful persons Clark believes that this method holds out a definite promise of ultimate good results, provided that the rules laid down by Percy are followed to the letter. Much credit is due to him for having elaborated this method, and where radium is not available Clark considers it the duty of every surgeon to equip himself with this apparatus.

From Clark's own experience, however, with the use of radium, he feels that this agent affords better, or at least equally as good, chances for cure without the attendant dangers of mortality incident to the operation as proposed by Percy.

From this review of the newer therapeutic methods in the treatment of carcinoma, Clark feels that we may conclude that definite progress has been made, but that as yet no genuine panacea has been discovered or even forecast by the reports of the most optimistic champion of the various methods here considered.

THE IMPORTANCE OF IMMUNIZING NURSES AND HOSPITAL ATTACHES AGAINST TYPHOID FEVER.

In the *New York Medical Journal* of September 4, 1915, FUNK states that this method is most important and gives the plan used at the Jefferson Medical College Hospital as follows:

Three doses of the vaccine are given at ten-day intervals. The first dose consists of 500 million, and the second and third doses one billion each. The inoculation is made subcutaneously on the outer side of

the left arm about the level of the deltoid insertion after the skin has been painted with tincture of iodine. The inoculations were made as a rule in the evening, so that any mild reaction might not be experienced during the night's rest. As a rule the only inconvenience of note was a slight soreness of the arm, which usually occurred after the first injection and promptly disappeared.

It is this writer's belief that a wider application of antityphoid inoculation among nurses will result in a distinct reduction in the incidence of the disease among them, a reduction which has not been accomplished in the past by instruction in the application of sanitary measures alone. The writer has been in possession of facts with regard to the source and frequency of contact infection, but has been unable to reduce the incidence of the disease. The combination of sanitary measures with prophylactic inoculation has seemed to accomplish results not hitherto obtained.

SPECIFIC TREATMENT OF MALIGNANT FORMS OF MALARIA.

Bass in the *Journal of the American Medical Association* of August 14, 1915, insists that the dose and method of administering quinine intravenously are important. The writer does not believe it is ever necessary to exceed 30 grains of quinine hydrochloride during twenty-four hours when administered intravenously, nor does he believe more than 10 grains should be given at one time. Large doses of quinine given intravenously are very dangerous. Twenty grains often produce considerable shock, dizziness, nausea, etc., and a dose of 50 grains has killed in several instances. A serious mistake often made in the treatment of the most urgent cases of malaria is the introduction of large and dangerous doses of quinine which are repeated at frequent intervals until the patient dies. The writer has known of several instances in which one hundred grains or more of quinine had been administered during the last twenty-four or thirty-six hours before death. Usually, this destructive treatment is continued because the patient continues to get worse. The symptoms attributed to a continuation of the reproduction of malaria plasmodia are usually due to quinine. Examination of the blood of such patients usually shows few malaria plasmodia, and most of them are dead or dying. The necropsy fails to reveal sufficient plasmodia to cause death. In other words the cause of death is quinine poisoning and not malaria.

In view of these statements and ideas, if correct, the amount of quinine given should not approximate the lethal dose. Danger can be further avoided by administering it in several small doses not exceeding 10 grains at any time. Ten grains of quinine hydrochloride given intravenously every eight hours or 5 grains every four hours will kill plasmodia in the blood stream and prevent their reproduction as certainly as any larger quantity, and will not endanger the life of the patient. It is true that it does not reach plasmodia lodged in capillaries until they segment and their merozoites appear in the blood stream.

Theoretically, inhalation of amyl nitrite should tend to dislodge plasmodia from the capillaries, and if done after quinine has been introduced into the blood would expose many of them to the action of the quinine that would not otherwise be exposed.

In most malignant cases of malaria the total quantity or mass of malaria produced during a single life cycle of the parasite is enormous. The volume of an estivo-autumnal schizont at maturity is about that of a red blood cell. Using this as a basis one may calculate approximately the total volume that would be produced in the body of the patient during the life cycle of a plasmodium. It is common to find in such cases at least one red blood cell in every five to contain one or more plasmodia. If it is assumed that a man has 6000 Cc. of blood, one-half of which, or 3000 Cc., are red blood cells, there would be produced 600 Cc., or more than a pint of malaria plasmodia. It is strange, but nevertheless true, that patients often recover when given proper treatment in spite of this enormous amount of foreign protein in their blood

stream. May it not be due to the fact that the protoplasm of the parasite is of very low toxicity?

As soon as a case of malignant malaria passes out of the severe attack, then of course the treatment is not different from that of other cases of malaria.

Malarial hemoglobinuria is discussed briefly. In malarial hemoglobinuria something occurs which causes hemolysis of the patient's cells. Cells containing plasmodia, and thus damaged, are affected more certainly and more extensively than normal cells. As a result they are hemolyzed, leaving the plasmodia they contained exposed to the plasma, which promptly destroys them. The only object of giving quinine in malaria is to destroy the plasmodia, and if most or all of the plasmodia have disappeared, which is the case in hemoglobinuria, there is no indication for quinine. There is a certain amount of contraindication, however, because quinine tends to increase hemoglobinuria or to precipitate attacks in otherwise susceptible individuals.

Finally the proper specific treatment of malignant or pernicious malaria is quinine administered intravenously.

The dose should never exceed 10 grains of the hydrochloride.

The total quantity should never exceed 30 grains during twenty-four hours.

Malarial hemoglobinuria does not require quinine. Quinine is harmful in most cases of hemoglobinuria.

ON THE USE OF SCOPOLAMINE-MORPHINE IN LABOR.

CROOM in the *Edinburgh Medical Journal* for August, 1915, reaches these conclusions:

No absolute routine treatment should be adopted.

Every case should be treated upon its own requirements.

The physician must be in constant attendance from the first dose, which should be administered when the pains become regular early in the second stage of labor.

The patient should be kept as quiet as possible.

The quieter the surroundings, the more successful the result.

It is important that the preparation should be fresh, and accurately prepared.

Fetal hearts should be carefully watched.

Artificial delivery, when necessary, should be accomplished under chloroform.

Oligopnea should be carefully watched for and treated when present.

SODIUM BICARBONATE IN HAY-FEVER.

In the *New York Medical Journal* of August 21, 1915, KELLOGG reports on this topic.

The writer's case-records show a series of fifty cases of hay-fever, covering a period of three years. The first patient presented a general acidosis with a mild and transient glycosuria; the second high specific gravity of urine with a marked acidity. Acting on the theory that the general condition served as a primary cause by reason of certain irritating qualities of the blood, making the mucous membranes hypersensitive, the writer gave both patients sodium bicarbonate in drachm doses three times a day. Such a marked relief from the rhinitic symptoms followed that he felt justified in administering the same treatment to the remaining forty-eight.

Reviewing the records, he finds that ninety per cent of the patients enjoyed a marked amelioration of symptoms, and seventy per cent complete relief after a few days' treatment; the remaining ten per cent were not as markedly benefited, although they all seemed to show some improvement.

The improvement of the local symptoms seemed to be independent of the exciting cause. Some suffered from the inhalation of cottonweed; some of ragweed; some of wild rose; others of goldenrod; and a few presented precedent lesions of the nasal interior. The alkali acted nearly the same in the majority of cases regardless of local or general conditions. It appeared to have a desensitizing action upon the mucous membranes. Possibly it may have also had some influence in keeping the toxins of the pollen from becoming soluble.

In three cases he found it necessary to supplement the treatment by the administration of a nasal spray of sodium bicarbonate solution. Regarding the effect the alkali may have upon the anaphylaxis or the allergic phenomena, he is unprepared to speak. The fact remains, however, that at least marked relief was given in a goodly number of cases, and for this reason he feels justified in reporting them.

This is a preliminary report. It will be followed by a more detailed one later.

THE RELATION OF VENTRICULAR FIBRILLATION TO CLINICAL CHLOROFORM SYNCOPE.

In the *Lancet* of August 7, 1915, EMBLY says that whether we are to conclude that ventricular fibrillation or cardiovascular inhibition is the cause of clinical chloroform syncope will have to rest with the weighing of respective approximate analogies. These analogies are set forth as follows:

1. Syncope from cardiovascular inhibition in dogs occurs only in the period of induction. This is the period of incidence of clinical chloroform syncope. That of ventricular fibrillation in the cat may occur at any time in reinduction during a prolonged course of administration.

2. Cardiovascular syncope from chloroform in the dog is frequently recovered from by artificial respiration, either alone or in conjunction with heart massage. This coincides with the recoveries from syncope in clinical instances. In the writer's experience established syncope from ventricular fibrillation in cats is not recovered from. If it is ever recovered from it must be very rare.

3. The control of the cardiac rhythm in the dog is markedly vagal and approximates in this respect to that of the human. In the cat, on the other hand, marked vagal control is not characteristic, and such control is readily inhibited. As already shown, a heart under vagus control is not prone to ventricular fibrillation; hence, like that of the dog, the human heart should not be liable to ventricular fibrillation.

4. Reflex syncope from cardiovascular inhibition in dogs under chloroform anesthesia occurs as readily as that in cats from ventricular fibrillation.

5. Syncopal states occur clinically either reflexly or from overdose, in which the heart does not stop, but the rate becomes very slow. This resembles similar states occurring in the chloroformed dog which are promptly corrected by vagotomy.

This statement appears to the writer to show a considerable balance of probability in favor of cardiovascular inhibition as being the cause of clinical chloroform syncope. In view of this, one must regard the protest made by Levy against the exercise of care to prevent overdosage as unwarranted by the data and as a dangerous teaching.

SOME OBSERVATIONS ON THE USE OF PITUITARY EXTRACT IN OBSTETRIC CASES.

The *Glasgow Medical Journal* for September, 1915, contains an article by MACFARLANE on this subject. He says that normal labor should absolutely exclude its use. The indications for its employment are:

1. In primary uterine inertia one must be absolutely certain that labor has begun, and not be tempted to use this substance on the occurrence of slight and premonitory uterine contractions. The extract has little or no power of initiating contractions. Further, the cervix must be dilated or easily dilatable.

2. In secondary uterine inertia one finds the greatest usefulness of this preparation. In practice one frequently finds the uterine contractions lessening during the expulsive period, and consequently there is frequent recourse to forceps extraction. The use of pituitary extract will very often obviate such operative interference, and likewise quickly terminate a second stage of labor, provided there is no undue obstruction.

3. In postpartum hemorrhage it has been employed as a preventive where such hemorrhage was feared. Some authorities question its superiority to ergot; others combine it with ergot hypodermically. It is stated that pituitary extract causes more frequent

uterine contractions; ergot and its preparations only strengthen the individual contractions. The writer's observations lead him to believe that a full dose (1 Cc.) of pituitrin causes marked uterine contraction of a prolonged nature, and scarcely permitting a uterus to bleed. One must always remember that severe bleeding may take place from a lacerated cervix, and yet the uterine body be firm and hard as stone. It has also to be borne in mind that there is a greater bleeding during the third stage—or rather immediately after the expulsion of the placenta—if this preparation has been employed early in labor, but this can be controlled by giving an injection of ½ Cc. immediately after the expulsion of the placenta.

4. In abortion cases, or in the induction of labor, this preparation does not begin contractions, but after free dilatation of the cervix by the bag or other dilator, uterine contractions having been started, the pains become stronger.

The following contraindications to the use of pituitary extract during labor should be carefully borne in mind.

1. Anemic patients sometimes become suddenly blanched and faint after its use. This the writer has noticed on three occasions, and it caused considerable alarm.

2. In stout, flabby patients he has seen the condition noted in No. 1—probably due to some altered muscle condition of the heart.

3. Chronic kidney affections and arteriosclerosis are distinct contraindications—at least considerable caution is necessary in all cases of high tension pulse.

4. Marked pelvic contraction prohibits its use.

5. A rigid and not easily dilated cervix should constitute a distinct contraindication. Severe laceration of the cervix and rupture of the uterus have been reported from the injudicious use of these preparations.

6. If very violent uterine contractions are caused by the injection there may be danger to the fetus, and chloroform anesthesia may be required.

CANNABIS SATIVA—IS THE MEDICINAL VALUE FOUND ONLY IN THE INDIAN-GROWN DRUG?

In the *Journal of the American Pharmaceutical Association* for April, 1915, HAMILTON concludes that, first, American hemp contains the active constituent; second, if equal care is exercised in selecting the proper part of the drug for extraction, no material difference in activity will be found between extracts of Indian and American hemp; third, apparent lack of activity and variability in activity applies equally to both varieties of this drug; fourth, under proper direction there is no valid reason why American hemp cannot be collected to advantage to replace the imported article.

MORPHINE AND SCOPOLAMINE AMNESIA IN OBSTETRICS.

In the *Journal of the American Medical Association* of September 18, 1915, POLAK says that granting, for the sake of argument, that "Dammerschlaf" is a rational obstetric procedure, what are its indications? It may be used in any labor in which the pains are actually established and there is no marked disproportion between the head and the pelvis. It is especially suitable in long, painful, first-stage labors, or in minor degrees of contraction when it is desirable to give the woman a full test of labor, and in the neurotic women of the mentally and physically unfit class. It is contraindicated in primary uterine inertia, marked pelvic contractions, accidental hemorrhage, placenta previa, the presence of a dead or dying fetus, as well as in obstetric emergencies, as prolapsed cord, prolapsed arm, and transverse presentations in which the membranes have long been ruptured.

From the writer's experience he can state with reasonable positiveness that this method has certain definite advantages: namely, first, the patient, in from 70 to 80 per cent of the cases, has a practically painless labor; second, that the nerve exhaustion which comes after prolonged labor is absent when morphine and scopolamine

FEB 12 1917

have been used properly; third, that the milk secretion is definitely increased, as shown by the gain in weight of the children in his series; fourth, that the cervix dilates more easily under this form of medication, hence cervical injuries are less frequent; fifth, that the number of midplane forceps operations is diminished; sixth, that the cardiac patients, even when there is some break in compensation, go through labor with a minimum of nervous apprehension and less muscular effort; seventh, the toxemic cases, even with increased blood-pressure, go through labor with less likelihood of convulsions, and the urinary output is not affected; and, finally, more babies are born alive owing to the more accurate observation of the fetal heart and the observance of obstetric indications than is common under ordinary methods. The dangers to the mother are practically *nil*, to the child the danger is from the prolongation of the second stage due to overdosage, and there is an interrelation between these two.

The writer has found little difficulty in watching the course of labor by abdominal and rectal examination, and in this way the number of vaginal examinations has been minimized. During the second stage the fetal heart should be auscultated every fifteen minutes and any change in its rhythm or rate noted. A prolonged second stage is injurious to the child, and this condition is met by the application of a tight abdominal binder, forced flexion of the thighs on the abdomen, expressio fetus, pituitary extract when the head is on the pelvic floor, and a median perineotomy in the presence of a rigid perineum. A proper appreciation of these suggestions will minimize even the number of low forceps required to terminate the second stage. The very severe pain of this stage may be relieved by nitrous oxide and oxygen, as suggested by Webster and Lynch, or the employment of a few drops of chloroform.

In the better class of patients there is little or no delirium. In the lower and more ignorant class considerable restlessness is always noted in the second stage. From the writer's personal experience and from the admirable statistics based on 1000 cases collected by Dr. Beach, which include the work of twenty-six different operators, the following conclusions can be drawn:

1. The twilight sleep state is a reality and is applicable in any labor in which there is no primary inertia, marked pelvic contraction, or the presence of obstetric accidents.

2. It is especially applicable to nervous women of the physically unfit type.

3. It is a valuable adjunct in the management of border-line contractions, for it allows the woman a full test of labor.

4. It is distinctly a first-stage procedure and bears the same relation to the first stage as chloroform and nitrous oxide bear to the second stage; it relieves the pain but does not inhibit the progress of labor.

5. It is particularly useful in cardiac cases as it relieves the nervous apprehension and secures dilatation with less muscular effort.

6. It diminishes the shock of labor, whether that labor be normal, prolonged, or operative.

7. It does not diminish the milk supply.

8. It does not predispose to postpartum hemorrhage.

9. It does decrease the number of high forceps operations.

And, finally, it has a distinct place in hospital obstetrics, and should be tried out by those who have control of sufficient material definitely to determine its position in obstetric practice.

HORMONES AND VACCINES.

In the course of an article in the *Journal of the Royal Army Medical Corps* for August, 1915, FIRTH tells us that in dealing with the therapeutic use of hormones it is convenient to divide the hormonic actions of the body into two classes, or the acute and chronic. A typical example of the former is the mechanism for secretion of the pancreatic juice, where the entry of acid chyme into the duodenum liberates in the cells of the mucous membrane a chemical

substance, secretin, which, absorbed by the blood-vessels of the gut, is carried to the pancreas, which it excites to secretory activity. Other examples of the same class are the production of adrenalin by the suprarenals under conditions of fright, and the chemical regulation of the activity of the respiratory center in accordance with the metabolism of the muscles and the production of carbonic acid. Although carbonic acid and adrenalin are being produced constantly in the body, their amount may be increased largely under certain conditions; the production of adrenalin is particularly a beautiful example of refinement of means by Nature for the one great end, namely, the undertaking of active movements for offence or defence. These demand a high blood-pressure, increased blood-flow through the heart, and a mobilization from the liver of the glycogen store of that organ, whereby the muscles are flooded with the food most readily utilized by them to supply the extra energy demanded. By this extraordinary power of raising blood-pressure, adrenalin is the magician which instantaneously initiates these essential factors for sustained effort. Even the clotting of blood by adrenalin is but a further elaboration to check leakage in any chance wound of the body during action; and the very machinery employed to prepare for combative effort may, with the cowardice of civilization and by a curious antithesis of emotions, be set as powerfully in motion only to express fright.

In all these cases it is essential that the reaction take place at once, and cease as soon as the exciting cause is removed. The hormones associated with these reactions must, therefore, be capable of rapid disappearance from the body, either, as in the case of secretin or adrenalin, by oxidative destruction, or, as in the case of carbonic acid, by elimination. Owing to the ready destructibility of both secretin and adrenalin, their employment in a substitution therapy is limited, and their administration by the mouth practically useless. Similarly, their only use is as drugs, because, though we can evoke the physiological action of these substances by introduction into the blood-stream, it is difficult to control or grade their action, as must be the case under normal or natural conditions. Adrenalin is constantly used for its local effects on the blood-vessels; personally, one employs it as an excellent and rapid means of stopping bleeding after a cut during shaving, but it is practically useless to replace the functions of an absent suprarenal medulla. It is known to be the most efficient cardiac stimulant, but its employment in a case of failing heart is discounted by the inability to dissociate its power of vascular constriction, and increasing the resistance to the blood-stream, from its action on the heart. Although secretin is an infallible excitant of pancreatic secretion it is doubtful whether good results can be expected to follow its use; it should be remembered that this alkaline juice enters the duodenum immediately after a certain amount of acid chyme, and the secretion of the pancreatic juice lasts only so long as the duodenal contents are acid. Cases in which secretin has been given to healthy animals have resulted in symptoms of acute collapse produced by the entry and non-neutralization of the highly alkaline pancreatic juice and degradation changes in the intestinal mucous membrane.

THE TREATMENT OF HIGH BLOOD-PRESSURE.

In the *Journal of the American Medical Association* of September 18, 1915, ELLIOTT states that the most important function of the therapist in high blood-pressure is the management of the cardiac phase. In the later stages when asystole has begun to develop, well-directed medical treatment may afford immense help toward the prolongation of life and efficiency.

Cardiac failure may develop in either of two ways in arterial hypertension—that is, as left ventricular dilatation with falling systolic pressure and diminishing pulse-pressure, or as a high-pressure stasis with rising systolic pressure and pulse-pressure maintained or increased. The former type

is characterized by relative mitral insufficiency and broken compensation with edema, the latter by splanchnic stasis, gallop rhythm, medullary dyspnea, often without edema and without heart murmurs.

High-pressure stasis calls for free hydragogue catharsis, perhaps bleeding; the type of left ventricular failure demands neither of these measures. They both require digitalis stimulation. Digitalis in the end becomes the staff on which the high blood-pressure invalid must lean. The writer makes the statement advisedly that digitalis is the most useful drug that we possess in high blood-pressure of whatsoever origin. The reason for this is that, after the maximum of hygienic and dietetic control has been enforced, no more can be done for cardiorenal hypertension, but we must wait until the heart begins to fail; then life may be prolonged for months and even years by the judicious use of digitalis and its congeners. The fact that the blood-pressure is high need not deter us from using digitalis. It acts just as well and even better with a high pressure than with a falling pressure. Indeed, it will lower a rising pressure and raise a falling pressure, provided cardiac embarrassment is the underlying cause.

Elliott's experience would lead him to urge that digitalis be employed early, at the very appearance of cardiac decompensation. It is a great mistake to reserve its use until further cardiac failure is in progress. We have to remember that we are dealing with an exhausted degenerated heart muscle, and should go to its rescue before it is placed at too great disadvantage. Digitalis early should be the rule, and once its employment has been begun, it should be continued until thorough compensation has been reëstablished. The writer has felt in certain cases that the cardiac status, even after apparent recovery of compensation, was too insecure to warrant discontinuance of support, and has continued digitalis medication as a routine for months and years with the greatest benefit. When compensation is badly broken and venous engorgement severe, the full therapeutic effect of the digitalis series cannot be secured by oral administration. Under such conditions its employment should be intravenous. Many times he has secured prompt and efficient support in this manner after administration by mouth had failed.

Strophanthin in sterile solution by intravenous administration is a highly efficient preparation in the heart failure of high blood-pressure. The writer can testify from many gratifying experiences to its rare value. As a means of picking up a failing ventricle, he knows of no equal of this preparation. If the rules that should safeguard the administration of this extremely powerful and toxic drug are carefully observed, it may be used without risk and often with the greatest benefit. One-half cubic centimeter of 1:1000 solution of strophanthin injected into the elbow vein at appropriate intervals for several doses will often induce cardiac reaction when other measures fail. After its effect becomes apparent, digitalis may be substituted and the effect continued. Unfortunately, in many cases the myocardium is so completely exhausted that response to any form of stimulation is impossible; but when any power of reaction remains, this preparation will best elicit it.

INFANTILE ASTHMA.

WARBRICK in the *Buffalo Medical Journal* for September, 1915, asserts that the cause of the trouble, whatever it is, should be looked for and removed; such as the presence of adenoids, edema of the glottis, or any nasal obstruction.

The bronchial form should be treated according to symptoms. The bowels should be kept well open as an important point in these cases with children, as any clogging up only tends to aggravate the trouble.

In the capillary form especially is this necessary, and also the catarrhal form tending to suffocation.

Fresh air is important and cold douching may be useful.

In the case of an overloaded stomach causing distress and gasping for breath, the

child should be made to vomit at once. This can readily be done by putting the forefinger of the right hand down the child's throat and at the same time bending its head downward. Children should not be stuffed at any time with all kinds of food such as cakes, pie, meat, or candies. Light nourishing food in the proper amount should be given.

The fumes of nitre should be avoided, also antiasthmatic cigarettes, and inhalations. The herpetic form should be treated by tonics and cod-liver oil. For the spasm morphine sulphate 1/30 grain and atropine hypodermically are useful.

Spraying the nose and throat may be useful, also adrenalin chloride used in the nose and silver nitrate applications. In the catarrhal form any congestion of the nasal or pharyngeal mucous membrane should be relieved. This may be done by spraying the nasal passages, the use of adrenalin chloride to contract the blood-vessels, and repeated applications of a weak solution of silver nitrate to the front of the nose.

ROENTGEN-RAY IN GASTROINTESTINAL AFFECTIONS.

AARON in the *American Journal of the Medical Sciences* for September, 1915, reaches these wise conclusions:

1. That the roentgenologist should be a trained and experienced anatomist and pathologist.

2. That there should be standardization of methods and technique.

3. That the physician acquire the ability to properly estimate the diagnostic value of a Roentgen-ray report.

4. That the patient should not be subjected to operation without a confirmation of the original findings by a second Roentgen examination made after an interval of two or three days.

5. That the clinician must not attach too much significance to the Roentgen-ray findings unless they are absolutely decisive.

6. That the lesion discovered by the Roentgen-ray must be a constant finding, regardless of position or slight variations in technique.

7. That great care must be exercised to differentiate physiological and spastic conditions from those that are essentially pathological.

8. That the Roentgen-ray report should be considered on the same basis as any laboratory report.

9. That the physician must carefully correlate the Roentgen-ray findings with the anamnesis and the clinical and laboratory findings.

ROENTGEN-RAY TREATMENT OF EXOPHTHALMIC GOITRE.

In the *Medical Record* of September 4, 1915, SIMPSON reaches conclusions as follows as to the use of the *x*-rays in Graves's disease:

1. Many cases of exophthalmic goitre are associated with enlarged thymus glands, and this association often causes serious postoperative symptoms and even death.

2. While such an association will seriously complicate and prolong a surgical operation, it offers no such added difficulties for the Roentgen therapeutist.

3. Not only such ductless glands as the ovaries and testicles but also the enlarged thyroid and thymus glands as well are very sensitive and may be atrophied by the Roentgen ray.

4. This theory has been amply proved by laboratory experiments and clinical results in many cases of hyperactivity of the thymus gland seen in cases of status lymphaticus and hyperactivity of the thyroid gland—exophthalmic goitre.

5. If these cases of status lymphaticus and exophthalmic goitre will give the Roentgen ray a fair and impartial trial the majority of them will be relieved of all troublesome symptoms and make unnecessary a disfiguring, dangerous, and often futile operation.

6. The above findings are not entirely the writer's own hastily formed ideas, but include the results of several hundred cases of exophthalmic goitres that have been successfully treated by the Roentgen ray, the literature of which is open to all who may care to investigate it.

THE HOW AND WHY OF VACCINATION AGAINST SMALLPOX.

FORCE in *Northwest Medicine* for September, 1915, gives these "don'ts":

1. Don't vaccinate with a tube of virus ordered by telephone from the nearest drug store unless you know that the druggist keeps his stock of biologic products on ice and is careful to renew them within the expiration dates stamped on the package.

2. Don't cross-scarify the arm. The vaccine colony has to grow outside the scab. A large scab tends to produce a slough and a deep pit in the arm. It is forbidden by law in Germany. Use a needle, making two single scratches about three-quarters of an inch long and one inch apart, or better still use a small chisel with a rotary motion, removing three small circles of epidermis about one-eighth inch in diameter each.

3. Don't remove too much epidermis. Large scabs favor tetanus. Many doctors think that the amount of vaccine used has something to do with the protection. This is incorrect. A very small colony of vaccine germs planted on the skin will multiply until the growth is checked by the antibodies. A single cubic centimeter of vaccine virus is enough for 250 vaccinations.

4. Don't vaccinate on the leg. The small scars do not disfigure the arm; the leg is exposed to injury, bears the weight of the body, and in babies is difficult to keep clean.

5. Don't use shields or bunion plasters to cover the vaccination. The shield causes the arm to swell and aggravates the soreness. Bunion plasters and wads of cotton are just as harmful. The best dressing is a plain square of gauze held in place by four strips of adhesive tape. Write the date for return on one of the tape strings.

6. Don't tell the patient that the headache and slight fever following the vaccination are due to varioloid. Varioloid may follow vaccination in point of time, but only when the immunity has expired, which usually means from ten to twenty years.

7. Don't put salves on the vaccinated area. On the ninth day a gauze bandage may be placed around the arm and kept moist with 50-per-cent alcohol in order to relieve the soreness. After the tenth day use a simple dusting powder until the scab separates. Apply tincture of iodine to the fresh scar.

8. Don't issue a certificate that you have used due diligence and cannot secure a successful vaccination. If you think that the person ought to be immune, look for the immunity reaction within twenty-four hours after the vaccination. If you think the person is not immune use fresh virus. Something has to happen.

9. Don't forget that the reaction of immunity is a sign of successful vaccination. Evidence of immunity is all that we are striving for, and a sore arm is not necessary to prove it.

10. Don't forget that inert virus may contain the necessary proteins to give the reaction of immunity. If you doubt the virus try it on a previously unvaccinated person.

11. Don't forget that vaccine virus is thoroughly tested before it leaves the vaccine establishment. If it fails in previously unvaccinated persons, do not blame the manufacturer until you have investigated the conditions surrounding the virus after it left the establishment where it was produced.

A SIMPLE TREATMENT FOR IVY POISONING.

LANE in the *Medical Record* of September 11, 1915, gives this advice as to the treatment of ivy poisoning:

The affected areas are loosely covered with two or three thicknesses of gauze or cheese-cloth, which is kept continually moist with a solution of boric acid, the strength of which is unimportant. The gauze is frequently changed in any case, but the frequency depends somewhat upon whether there is much oozing from the blebs. The larger blebs are opened, but it is unnecessary to touch the smaller ones. If the gauze is used more than once, it is rinsed and boiled before it is reapplied. As the largest number of these cases occur during hot weather it adds to the comfort of the patient to keep a small piece of ice in the solution so that it may be applied cold.

This is usually the whole treatment, but in cases in which the itching is very intense some additional relief may be obtained by gently sponging with a weak solution of alcohol when the gauze is changed. A simple ointment may be used for protection after healing has begun and the skin has become fairly smooth.

The advantage of this treatment is that no trauma is inflicted, and that if powder settles on the skin from evaporation of the liquid it is easily dissolved at the next application by using a more dilute solution.

GLUCOSE SOLUTION AS A PROPHYLACTIC IN SHOCK.

In the *American Journal of the Medical Sciences* for September, 1915, BURNHAM reminds us that it is important that patients about to be subjected to major surgical operations should, when possible, be put through a course of forced carbohydrate feeding for a short period immediately preceding the operation, and should receive carbohydrates in an available form soon after operation.

Secretan has called attention to the importance of giving food shortly before anesthesia as a prophylactic measure against postoperative shock. He asserts that it is usually safe to give some easily digested food from two to four hours before the anesthesia is begun. A patient in whom there is no contraindication to oral feeding may be given a meal containing a considerable quantity of carbohydrate food in the shape of bread or cereal eight to twelve hours before operation, and a feeding which contains 100 to 200 calories in the shape of easily absorbable carbohydrate about three hours before the anesthesia is begun. In practice the writer has found that the latter is best accomplished by giving either six ounces of coffee or orangeade to which has been added one ounce of lactose. The above procedure should assure the organism of a considerable store of readily available glycogen during the period of anesthesia.

If we grant the plausibility of the argument up to this point, it must necessarily follow that carbohydrate feeding should be instituted at the earliest opportunity after the operation. During the anesthesia, and for a period afterward, varying from a few hours to a few days in individual cases, oral feeding is impossible, so that we are, of necessity, forced to resort either to subcutaneous or rectal nutrition, or both. The writer has discussed the various types of nutritives which theoretically may be used for subcutaneous nutrition, the conclusion being reached that glucose is the only form of nutritive which is clinically available for this purpose. Barlow recommended the subcutaneous use of glucose in 1895, and it has been in sporadic use since that time; but it was not placed upon a scientific basis in surgical cases until the publication of Kausch, in 1911.

Sugar, in the form of glucose solutions, supplies energy to the cells and aids in tissue repair; it diminishes acidosis and thus tends to remove one of the factors in the cause of postoperative vomiting; it neutralizes certain poisons in the circulation (the conjugate glycuronates is the best example of this action); and it is possible that it acts as a direct cardiac stimulant and food. In addition to this, the solution introduced has many of the advantages and few of the disadvantages of saline solutions. Only a small percentage of the glucose injected hypodermically finds its way into the urine (usually from 2 to 5 per cent). The remainder, as has been proved by the calorimetric experiments of Vezar and von Fejer, is burned in the body, causing an increase in heat formation and a corresponding increase in the respiratory quotient.

Kausch recommended 7-per-cent solutions intravenously and 4- to 5-per-cent solutions by hypodermoclysis. Solutions should be freshly prepared and sterilized, as they become more easily contaminated than does the ordinary saline. Strictly speaking, contamination is as easy in one as in the other, but owing to the fact that glucose is an excellent culture medium, accidental contamination is of more consequence than it is in common salt solution. Following the use of glucose by hypodermoclysis, there is not

more pain or discomfort than after the injection of a physiological salt solution. As much as two or three liters, representing from 90 to 210 grammes of glucose, may be given during twenty-four hours, the amount depending on the character of the case and the urgency of the symptoms.

In addition to hypodermic administration, glucose may be given by proctoclysis during anesthesia and for a period of several days after operation. It is given in 5-per-cent solution, dissolved in ordinary tap water, 12 to 16 ounces being introduced during the operation, and its administration continued, by the Murphy drip method, after the patient has returned to the ward. This method is so simple and has apparently been of such value that it should be used as routine after every severe major operation. From 300 to 500 calories a day may be introduced by one or both of the above methods without discomfort to the patient. This quantity, while insufficient to supply all the total energy requirement, is of great importance in the prevention of excessive nitrogen waste.

X-RAY TREATMENT OF UTERINE FIBROIDS.

STERN *(American Journal of Obstetrics,* September, 1915) after reporting successful cases concludes that the dangers of *x*-ray therapy in the treatment of uterine fibroids, with proper technique, are absolutely none. In cases in which we want to establish a permanent amenorrhea, the massive dosage method (Freiburg technique) is decidedly superior to the fractional dosage method, as giving quicker and more satisfactory results.

In younger women in whom we merely aim to get a diminution of the size of the fibroid, with a temporary amenorrhea and a reëstablishment of menstruation, the fractional dosage method is preferable. In these cases, a comparatively short time after the reëstablishment of menstruation, the patients may conceive, go through a normal labor, and give birth to normal children. All uncomplicated cases of uterine fibroids are amenable to *x*-ray treatment. The nearer the patients are to the climacteric period, the surer and quicker the results. In these cases, properly treated, we can look forward to getting practically 100 per cent cures.

Frank in the same journal states that Röentgenization of uterine fibroids cannot be used with safety in rapidly growing tumors; in cases of metrorrhagia in which complete preliminary curettage with microscopical examination of the curettings is not feasible; in complicated cases in which ovarian cysts or serious adnexal trouble cannot be excluded; in fibroids complicating pregnancy. He believes that the rays should not be used where expense is a factor, or where time is a factor. The rays are of chief value where operation is declined; where operation is contraindicated by serious heart, renal, or pulmonary lesions; where operation is contraindicated because of extreme psychical unrest. Consequently *x*-ray treatment is applicable to at the most 5 or 6 per cent of all patients having fibroids.

Pfahler *(New York State Journal of Medicine,* September, 1915) says that Roentgen therapy must be looked upon as a very efficient adjunct to the gynecologist's armamentarium, and while he believes that the rays should be applied by the roentgenologist, he should at the same time work hand in hand with the gynecologist. Deep Roentgen therapy stops the hemorrhage associated with uterine fibroids. This is followed by a gradual disappearance of the tumor. This atrophic process may extend over several years, continuing long after the cessation of treatment. The treatment of metropathic hemorrhage is almost uniformly successful. Uterine hemorrhage occurring at the menopause, when not malignant, will usually respond very quickly. There should be an increase in weight and an improvement in the blood condition following treatment, and when this does not occur suspicion of malignancy should be aroused (Albers-Schönberg). Some good results can be obtained in inoperable carcinoma. The deep Roentgen therapy should be especially recommended as postoperative treatment in all cases.

THE MODERN TREATMENT OF BURNS.

TUDER *(International Journal of Surgery*, August, 1915) for the treatment of shock recommends morphine, atropine, camphorated oil, and caffeine or digitalin. Normal saline, warm, with a little adrenalin added, or glucose-soda solution should be administered continuously during the stage of severe shock by enteroclysis. Oxygen inhalations, if available, should be employed when the condition of shock is grave.

The method advised for cleansing the burnt part is sterile normal saline, hydrogen peroxide, tincture of green soap, and if there be grease or oil or much dirt, benzine followed by alcohol. Tincture of iodine is so generally used as an application to dirty wounds that we naturally think of it in connection with burns, but it is too irritating. Saturated solution of bicarbonate of soda is regarded as effective for relieving pain. The best solution is said to be a saturated aqueous solution of picric acid. Ehrenfried is quoted to the effect that this is fifty times more active as an antiseptic than the same strength of carbolic acid solution. It coagulates albumen, and over a clean denuded surface a protective aseptic scab is formed by the coagulation of the secreted serum. Sterile gauze is applied to the wound and thoroughly saturated with the picric acid solution, and over this oiled silk and a gauze bandage are placed. The solution is said to be bland, unirritating, and analgesic. The dressing is removed the third or fourth day and the vesicles are punctured. This is repeated every four or five days until healing is completed, or oftener if there be suppuration or infection. If the urine becomes cloudy the picric acid solution should be stopped.

The author predicts that the open-air treatment will be that of the future. His conception is that after cleansing the entire area is left open, the lesion being exposed to the sunlight at first for half an hour, this time being gradually increased to an hour or more each day. The temperature of the room is kept high to favor drying. Bland dusting powders are applied daily in the open-air treatment, stearate of zinc and zinc oxide being the favorites. Scarlet red in an ointment of from five- to ten-per-cent strength is recommended where the healing of the growth is slow. It should be applied only to the granulations, as it is irritating.

It is a matter of frequent observation that a person suffering from severe or sometimes even a mild burn and doing well may suddenly become profoundly ill, exhibit convulsions, delirium, falling temperature, and die. The tendency now is to explain these late phenomena as a condition of anaphylaxis induced by absorption of substances from the burned tissues, which act like an antigen; the body after a time becomes sensitized, and further absorption is followed by anaphylaxis phenomena. Heyde notes that similar phenomena can be produced in animals at will by inflicting a small burn, or reimplanting some of their own tissues incinerated outside.

PREVENTION OF FISTULA IN ANO.

LOCKHART-MUMMERY (*Lancet*, Oct. 2, 1915) observes that the usual fistula begins as a small tear or wound in the mucous membrane of the anus at the point of greatest resistance—the "white line," or upper level of the external sphincter. Infection follows, and the submucous wall of the bowel is involved. Thereafter an abscess readily spreads in the loose cellular tissue, which is particularly abundant in this area, and since in this situation there is no deep fascia to limit its extension, and the subcutaneous fat is here directly continuous with the fat in the ischiorectal fossæ, an abscess of considerable dimensions is rapidly formed, resulting in fistula unless promptly opened. The ordinary signs of abscess, such as redness, swelling, and heat, may not be obvious until a comparatively large size has been reached. Pain and local tenderness are the only early signs of abscess in this region, often accompanied by slight constitutional symptoms. If opened at this stage a fistula will result. Abscess may be discovered at this stage by introducing a finger into the rectum and palpating between the finger and thumb. Thus

may be found induration accompanied by marked tenderness. These signs may be sufficient to warrant an incision. The knife is introduced through the skin some little distance away from the anus. There may be shown a slight discharge of sero-pus. This does not mean the incision was unnecessary. A small drainage-tube may be inserted and stitched to the edge of the skin. It should not go to the bottom of the abscess since it is designed only to keep the skin apart and allow free evacuation of the discharge from the area of inflammation. The tube is removed in about forty-eight hours, providing the discharge has ceased.

At present the history of a case of fistula is always the same, namely, pain, tenderness in this region coming on suddenly; fomentations administered by the doctor for some days, with consequent relief from pain; then the opening or bursting of a large abscess, which fails to heal completely and becomes a fistula.

THE CONTROL OF THE OCCUPATIONAL DISEASES.

In an editorial in the *Boston Medical and Surgical Journal* of June 10, 1915, attention is called to the fact that it is within the functions of the Board of Health to establish a Bureau of Hygiene, and that the functions of such a Bureau should be the establishment of a central occupational disease clinic for research investigation on the lines of Professor Devoto's clinic for industrial diseases at Milan. Such a clinic should be separate from the tuberculosis clinics, although acting in harmony with them and in coöperation with the university and hospital clinics throughout the city; it should be the clearing house for all specific occupational diseases and industrial poisonings, should make a study of the prophylaxis of the various industrial affections met with, and should be supplied with ample means for its work of investigation and research.

There should be established an industrial hygiene educational division which should endeavor by all possible means to spread the knowledge of the causes of industrial poisoning, the preventive measures to be taken in various industries, and right modes of work and living for the industrial population. It should also, in coöperation with the various manufacturers' associations and other existing bodies, as well as with the Department of Education, endeavor to conduct a general campaign of education among employers and workers as to the prevention of occupational diseases and the preservation of the health of the workers.

TONSILS AND CHRONIC CERVICAL ADENITIS.

GARDINER (*Lancet*, Oct. 2, 1915) concludes a paper as follows:

In the majority of cases (80 per cent) of chronic cervical adenitis where no obvious source of infection is present the tonsils are infected.

The size of the tonsil makes no difference to its infectivity, except that the small fibrotic variety is likely to be more dangerous than the large.

The number of cases in which tubercle bacilli are present is relatively small, but is larger than in simple cases of enlarged tonsils.

The frequent presence of other organisms than the tubercle bacillus in these cases suggests that a large proportion of the so-called chronic tuberculous glands are in reality chronic septic glands.

The organisms are present in the deepest parts of the gland, and are therefore only removed by operations involving complete enucleation.

LATE RESULTS OF SURGICAL TREATMENT FOR FLEXED SCAPULÆ.

MARSHALL (*Boston Medical and Surgical Journal*, June 3, 1915) quotes, with approval, Goldthwaite's concept that removing the tips of the superior angles of the scapulæ may stop painful symptoms in backs if the offending exostoses or abnormally flexed upper parts which scrape over the ribs are trimmed sufficiently to prevent further friction and irritation. This operation has been performed at the Massachusetts General Hospital upon 11 patients

during the four years ending January 1, 1912. It is stated that two or three months ought to be reckoned as the minimum of time that will be required for annoying symptoms of soreness after very active use to subside; and some of the best cases have needed a year's time for perfect recovery of normal shoulder functions. Patients are grouped in three classes: first, those who should receive prompt surgical care; second, those who should delay having operative interference; third, a border-line class. Some of the cases reported showed there were abnormal scrapings of the shoulder-blades over the chest muscles, and that these palpable rubbings were stopped by removal of the tips of the superior angles of the scapulæ, yet sometimes without subsidence of painful symptoms. The operative group should include those patients of adult age, especially of middle life, who present the following features: Painful symptoms of several years' duration that have been associated with otherwise fairly good health. In connection with these limitations there should be localized tenderness combined also with abnormal crepitus at the shoulder-blades.

Extremely acute cases of much shorter duration should be included in the first group. An artificial dividing line can be suggested as a minimum limit for operative interference, namely, all cases of moderate severity in adults who have shown local signs and pathological symptoms continuously for six months, or milder cases of one year's continuous duration.

The non-operative group comprises adult cases of moderate severity that have received no treatment, or those patients that have been treated unsatisfactorily for less than one month with protective and medicinal measures. In mild cases several months must elapse before they should be considered as having passed on from the second class into the third debatable group, from which they finally may emerge at the end of the year into the first-mentioned operative group. Youthful patients with mild symptoms remain in the second non-operative class until they have grown up.

The last more doubtful group contains moderately severe types of one to six months' duration; mild cases from several months to one year's duration; and the class of neurasthenic debilitated patients who present signs or symptoms of pathological scapula irritation.

Certain patients show very good results who did not exhibit at their operations exceptionally great anatomical peculiarities, so that it seems as though long duration of their irritations was of more importance than overdeveloped and abnormal flexions of their shoulder-blades.

In contrast with patients possessing scapulæ of average development with pathological symptoms, it should be recalled that many healthy persons are carrying around flexed and overdeveloped scapulæ without any abnormal indications of those variations, just as variations in other bony structures, such as anomalies of the vertebral column, very often occur without symptoms or signs. All such individuals, however, have their health constantly menaced to a greater or less extent corresponding to degrees of anatomical variation; yet they are enabled to maintain their normal healthy activities because of high degrees of resistance of the tissues and on account of compensating powers of related parts.

It is not of rare occurrence to find slight scapular crepitus without symptoms in muscular well-developed men, and it seems that too much importance should not be attached to mere smooth rubbing of the shoulder-blades over the irregularities of the chest wall. When combined with tenderness localized at the prominent edges of the scapulæ, friction possesses then much more significance.

Tenderness in shoulder-blades generally means local inflammation; and in routine examination of many back cases in any large orthopedic clinic there are numerous examples discovered of slight tenderness without crepitus among scapulæ of debilitated persons. If these individuals do not receive protection and personal hygienic treatment they are liable to develop chronic irritations with the gradual appearance of

abnormal frictions of the blades against the chest. Perhaps it will be readily understood that when patients come for the first time with well-developed signs and symptoms it is often difficult to say whether anatomical peculiarities or vascular defects are primary origins; yet, whichever were at fault, surgical interference depends more on the severity and duration of symptoms than on underlying causes. The surgical problem simply is one of removal of irritating bony angles regardless of the manner they acquired their irritating peculiarities, and more or less irrespective of whether they are excessively or slightly developed.

Pain, as shown in this series, is referred by patients to the scapulæ, to the region between them, and around to the sternum in front of the chest in acute cases. It radiates up behind the ears at times, and also down the arms, and there may be crampy sensations in the trapezius muscle as the latter tries involuntarily to hold the shoulder in comfortable position. Pain is noticed upon motion, especially when the arms are moved in directions that demand greatest rotation.

All exhibit greater or less degrees of round shoulders, this confirming Goldthwait's idea of an origin in habitual bad posture of the shoulders during the early years when the bones are readily molded into various degrees of flexion. As the bones strengthen and harden in adult life they retain afterwards their peculiarities permanently, and can be changed only by operation.

At the time of surgical interference the eleven patients of this series ranged from fifteen years to forty-two years of age, averaging twenty-seven. The girl of fifteen still has pain in her arm, while the man of forty-two at the other extreme has perfect function of his shoulders. It seems that the best results of operation are seen in middle life, when several years' duration of symptoms have made the advantages of surgery undeniable, and while the individuals are still in active robust health.

The analyses of the cases are not entirely convincing. Thus the first girl, fifteen years old, with burning sensations at night and after using her arm thus intermittently for years, the pain being referred especially to the infraspinous region of the scapulæ with the sensation of a lump in the muscles, was immobilized with adhesive straps and with a shoulder brace in vain. Exercise and massage were equally futile. Thereafter tenderness was localized along the vertebral border near the superior angle. Very distinct crepitus could be felt while the arm was being fully elevated, and this scraping had been noticed by the patient herself.

The tip of the superior angle was removed, and the patient was discharged from the hospital in ten days. The operation wound healed perfectly without adhesions, although buried catgut sutures caused a little trouble during the first few months afterwards.

Three years and two months after the hospital treatment the patient returned for observation. She complained then of the same burning sensation in the back and arm, at times over the shoulder-blade. Examination at this time showed a perfectly healed operation scar; arm motions were not restricted at all. There was betterment of all symptoms. The author holds that the disappearance of crepitus incident to the operation, with presumably the tenderness, gives good reason to believe that the operation did no harm, that a perfectly definite defect was removed which would have become an increasing menace, and that the results justified the treatment.

The second case, a woman thirty-nine years old, suffered for fifteen or more years with pain between the shoulders. Examination showed marked tenderness of the superior angles of both scapulæ, which seemed abnormally prominent. These scapulæ were trimmed in February, 1911. The shoulders were first partially immobilized with adhesive straps, then regular exercises were tried without appreciable benefit; high-frequency electrical treatments next were experimented with, and repeated applications of radiant heat

seemed to the patient finally to improve the symptoms gradually.

There seemed improvement when the patient was seen nearly four years after operation; though there was some return of pain after use, the patient expressed himself as well content with the result.

The third case, that of a strong man with knife-like pains in his shoulder-blades extending around at the same level to the sternal region in front, noticed these same symptoms in carrying a quarter of beef on his shoulder. Continuance of this work aggravated the first mild ache until it became unbearably severe after four months.

Before the operation soft crepitus could be felt on moving each scapula, and the upper vertebral border of the left one was tender to pressure. Moderate incurving of both tips was found at operation, and pieces of bone one-half an inch across were removed from them. In ten days the patient could use his arms comfortably. One year later there was a return of pain between the shoulder-blades, and mechanical exercises were advised; but these were not carried on long because the symptoms subsided.

Four years after operation pains in elbow, wrist, and shoulder were complained of, and an *x*-ray showed some hypertrophic changes about the elbow.

Five years after operation both shoulders were perfectly normal in strength and function. There was no crepitus or tenderness over the scapulæ, and the patient continued to work handling heavy beef. He thought the operation had been of very great benefit. As to the summary of the cases, the author's statement is as follows:

Six of the eleven patients operated on returned for observation and two reported by letter. Six of these eight thought they had been much benefited, one could not make up her mind, and one said that she could use her arms just the same as before the surgical treatment. The three persons who had not been heard from recently were all improved when they were seen soon after leaving the hospital. None say they are any worse, and no weakness or other objectionable after-effects that can be ascribed justly to surgery have been discovered in any of them. With regard to time for recovery, acute symptoms in all subsided by the time operation wounds healed enough to permit the patients to leave the hospital; and in three months the large majority had good function in the shoulders again. In a year's time some of the most protracted cases had been perfectly relieved.

Neurasthenic pains in arms in growing or debilitated persons were not relieved by scapula operations.

Non-operative treatments — shoulder braces, medicinal tonics and eliminants, hydrotherapy and exercises—should always be tried first for a month or more whenever circumstances permit. Many mild cases recover without surgery, and the latter should be employed only when subsequent advantages seem to overbalance the slight dangers and inconveniences of the operation itself, and when patients seem to be of suitable type. The most favorable cases are middle-aged persons in otherwise good health, and the most unfavorable combinations are found in young individuals from fourteen to eighteen years who are nervous and debilitated.

PARANEPHRITIC ABSCESS.

SIMON (*Deutsche Zeitschrift für Chirurgie*, Bd. 131, Heft. 5 and 6) reports from Küttner's clinic upon paranephritic abscess occurring from 1888 to 1911, to the number of 35 cases. The ages ranged from two years to fifty-eight years—21 males, 14 females; 17 right side, 18 left side. There were two recurrences. As to etiology, 8 cases followed felons; 3, direct trauma; 4, indirect trauma; 2, perimetritis; 1, appendicitis; 1, tuberculosis; 15 of uncertain origin, though 4 of these were suspected to be tubercular. As regards the bacteriology, 3 were sterile; 14 showed staphylococci; 2, streptococci; 2, colon bacillus; 1, pseudodiphtheria; in the remaining cases the organism was not determined. Special symptoms and complications were flexion of the hip in 12 cases; lung and pleural

involvement in 11 cases; bilateral suppurative pyelonephritis and calculus in 1 case, nephritis in 7 cases, and psychosis in 1 case. In 18 cases exploratory puncture was done, and without bad effect in any instance. It must, however, be admitted that through this puncture there is danger of spread of the infection. In 12 cases the twelfth rib was resected and drainage instituted. Local anesthesia was used in 5 cases, but as a rule these cases required ether.

The healing time varied from three weeks to fifteen months, but it usually was complete in two to three months. Fistula developed in two cases, and hernia in one case. One case recovered spontaneously, probably by rupture of the abscess into the pelvis of the kidney. As to the late results, 27 out of the 30 operated cases were heard from. Of these, 19 were entirely well, 4 not well, and 4 had died.

OBSERVATIONS ON THE INTRANASAL TREATMENT OF DYSMENORRHEA.

O'REILLY (*American Journal of Obstetrics*, October, 1915) states that in 1897 Fliess, the pioneer, attracted the attention of rhinologists to the connection, which was up to that time unknown, between the nose and the genitalia and the adnexa. He pointed out that in the nasal mucous membrane there were certain areas which he called genital spots; he located one on the tuberculum septi, an area about 1 mm. or possibly smaller, directly opposite the middle part of the middle turbinate, and the other on the anterior portion of the inferior turbinate on either side of the nose. If one observes, by means of reflected light and nasal speculum, at the time of menstruation these particular areas, he finds them slightly cyanotic, very sensitive to the touch of an applicator, somewhat swollen, and showing a tendency to bleed easily. Fliess' first experiments were with cocaine, which in a 20-per-cent solution was applied to the spots during an attack of dysmenorrhea. His observations were that the pains in the back and abdomen ceased after a five- to eight-minute application, and did not return until the effect of the drug had disappeared. If the anterior portion of the inferior turbinate on either side of the nose was touched, the headaches ceased, but it had no effect on the abdominal pains. If one side of the nose was treated with 20-per-cent solution of cocaine, applied to both of the spots, the headache and the pain on the opposite side of the abdomen were relieved.

Since then these results have been confirmed by Dr. Emil Mayer with menthol, cocaine, and caustics, and by Fliess and Kuttner. Different applications have been made to these spots by means of the galvanocautery, bipolar electricity, and finally with trichloracetic acid, with varying results as to the succeeding menstruation, some of which have been painless, in others the pain has not been as severe as prior to the treatment, and in some cases there has been absolutely no result at all. Seifert, following in the footsteps of Fliess, came to the following conclusions:

There are many indications pointing to a direct relation between the nose and the sexual organs, but the nerve path is unknown.

General circulatory and mechanical conditions have a greater or less modifying influence on the nose as a result of sexual conditions and functions.

Many pathologic conditions of menstruation coexist with a genuine nasal reflex neurosis or nasal hypertrophy with its results.

Uterine influence through nasal conditions may be largely explained by suggestion, by cocaine euphoria, greater in certain individuals than in others, by relief of a nasal reflex neurosis, and through the restoration of the general health as a result of restored respiration and relief of nasal congestion.

O'Reilly further quotes Brettauer to the effect that permanent relief is obtainable by nasal treatment in from 50 to 75 per cent of these cases, and states that trichloracetic acid applied to the genital spots four times at intervals between the menstrual period is usually sufficient to obtain lasting results

As to the technique, the genital spots are thoroughly cocainized by means of a pledget of cotton wet in a 20-per-cent solution of cocaine with adrenalin. This pledget is allowed to remain in contact with these spots for three minutes. They are then tested by means of a probe as to their sensitiveness, and if sensation is still found to persist, the application is repeated for another three minutes. Then a crystal of trichloracetic acid on the point of a probe is applied to the tuberculum septi, and another crystal is applied to the anterior portion of the inferior turbinate on each side of the nose. The slough that forms disappears in about five days, when the same process should be repeated; in all four applications must be made between the periods. The patient is then requested to report her results at the next menstruation. If this is favorable, no other treatment is resorted to, except that two more reports are requested at the following menstrual epochs, and if these are favorable the patient is discharged. In cases in which relief is slight, or not at all favorable, four more applications should be made between the menstrual periods, and if no benefit is reported the treatment must be put down as negative.

The chief reason for not resorting to the galvanocautery in preference to trichloracetic acid is the danger of forming synechiæ.

PELVIC VARICOCELE.

PINKHAM (*American Journal of Obstetrics*, August, 1915) observes that the chief symptom complained of by many women seeking advice for the so-called female troubles is a persistent, dull, aching pain in the left iliac region. This pain, which at times is barely noticeable and at other times very severe, is in many instances relieved by the recumbent position, is aggravated by standing or walking, and is usually worse at or during the menstrual period. This symptom is frequently unassociated with a palpable intrapelvic lesion, except, perhaps, a slightly enlarged ovary or a retrodisplaced uterus. In the parous woman there may be tears of the cervix or the pelvic floor. Women who have uterine displacements or lacerations undergo the usual operations for these conditions, and many are ultimately relieved, but some are not. Women presenting no palpable lesion except slightly enlarged ovaries are often told that they have chronic ovaritis, or that there is absolutely nothing the matter; that the pains are due to their neurotic condition. That there is always a good reason for physical suffering is a fact too frequently overlooked.

Every gynecologist will acknowledge that chronic pelvic pain is most frequently found on the left side. Herman states that in 75 per cent of the cases of retrodisplacement the pain is referred to the left side. Novak states that in cancer of the uterus, pain is referred to the left side in about 81 per cent of the cases. In a series of 2000 cases in one of the clinics of the New York Post-Graduate Hospital, 1450 located the pain on the left side. This localization has been explained in various ways, some of which seem hardly credible. Herman says that the reason is to be found in the fact that the left side is weaker than the right, not only in muscular strength but in power of resistance to painful impression. In Clarke's opinion, it is due to strong tension of the mesentery over the brim of the pelvis. Many writers attribute the cause to the anatomical arrangement of the organs on the left side—the presence of the sigmoid with its mesentery encroaching upon the attachment of the broad ligament to the brim—and the backward course of the left ovarian vein to the renal vein. This last explanation seems to be the most rational, easily accounting for the morbid conditions to which it is the object of his paper to call attention.

On the left side, the ovarian vein, the principal drainage canal of the outer part of the broad ligament, after leaving the infundibulopelvic ligament, runs inward and upward behind the mesentery of the sigmoid and descending colon to the renal vein, which it enters at right angles. It

has at best only two valves, one at its exit from the plexus, and one as it enters the renal vein. Sometimes one or both valves are missing. It is easily seen, therefore, that interference from above with the free passage of blood, or the lack of propulsive power from below, must tend to produce venous engorgement. This interference and lack of power have much less force on the right side, because here the ovarian vein runs from the infundibulopelvic ligament at an acute angle over a short distance to the inferior vena cava.

The child-bearing woman is the most frequent sufferer from this condition. During pregnancy the return flow of blood from the pelvis may be interfered with by the weight of the uterus, tight clothing, constipation, etc. Constitutional disease, debility, anemia, etc., may hinder the proper involution of the veins after delivery. Traumata of a severe prolonged labor, the use of forceps, and unskilful delivery often induce subinvolution. Lacerations of the parturient canal destroy to a more or less extent the integrity of the vascular support and diminish the propulsive force necessary for the proper function of the veins. Retroflexion of the uterus, which is usually the result of subinvolution, tends to slow the venous stream. Relaxation of the uterine supports, including a descensus after a prolonged second stage of labor, is, in the opinion of the writer, a very common cause of venous stasis.

Apart from the results following child-bearing, the conditions favoring varicocele are increased abdominal pressure from constriction of the upper abdomen, by tight corsets, bands, etc., abdominal ptoses, new growths (tumors, etc.), inflammatory processes, adhesions, constipation, and extensive hyperemias, such as are caused by overindulgence in coitus, constant and unsatisfied sexual desire, and masturbation, which so flood the venous exits as to induce passive congestion.

In the writer's experience the most frequent causes, especially in the young woman or nullipara, are a sigmoid adherent to the outer third of the broad ligament and constipation, either a complete failure to empty the bowel at proper intervals, or only partial evacuation. In a great many instances, where the lower bowel has been emptied, the upper part of the sigmoid or the descending colon may remain full for days or weeks. The mechanical pressure exerted by a constantly distended bowel must necessarily tend to obstruct the flow in the ovarian vein and produce dilatation of the venous plexus of the broad ligament. There is no doubt that many women could be relieved of their left-sided pains if the simple operation of ligation of the varicocele were more frequently performed. In youth and adult life, where health and vital forces are above par, nature, in her wonderful supervision, is able to overcome such obstacles if the opposing forces are not too long applied. If, however, the stress continues beyond the sustaining point, or the vital forces have been weakened by debility, child-bearing, or disease, the result is a compensatory dilatation of the venous plexuses, which is designated as a varicosity.

No one will deny that varicosed veins cause pain, and a pain that is very characteristic in that it is a dull ache of a very annoying persistence at times, while at other times it is sharp, shooting, or neuralgic.

Pain of this kind is usually made light of by most women for a long time, for two reasons: first, because, as a rule, it comes on slowly and for a while is not unbearable, and tradition teaches that there is always some pelvic pain of a negligible character following child-bearing; and second, most women believe that there is a good physiological reason for mild pain during the menstrual life, or that, in some way, the normal ovary in performing its functions is to blame; and, too frequently, her ideas are seconded by her physician. When the suffering becomes too constant or too severe, the patient consults her doctor, and oftentimes discovering for the first time that she has pathological conditions of which she was completely ignorant, readily consents to treatment or operation. It is not uncommon to find that a great many

women, after the usual gynecological operations, continue to complain of the same old chronic pain which existed before going to the hospital, and it is very difficult to persuade these women that everything had been done for the best.

The writer believes that if pelvic varicosities were given more consideration in the diagnosis of these cases, there would rarely be a case which would not give full credit to the surgical procedures. The diagnosis of pelvic varicocele must usually be made by elimination. Sometimes it may be felt as a fulness in the outer portion of the broad ligament on bimanual examination, after elimination of the intestines and omentum. This fulness is easily compressible, but is without form, and resumes its bulk after the pressure has been removed. There is only a slight degree of pain elicited by the pressure. There is never an acute sensitiveness or any transmitted pain. In the presence of adhesions or agglutinated organs, the mass felt is very appreciable and less easily compressed. This appreciation, of course, is possible only when the abdominal wall is thin or very relaxed. It might be said that the combination of a dull, persistent, aching pain, as described above, with the absence of any gross lesions, is pretty good evidence of the existence of varicocele.

In the elimination of conditions other than gross lesions, great caution should be exercised in attributing the origin of the symptoms to the ovary; for chronic ovaritis, or sclerotic ovary, never gives rise to pain of such a description. The pathology of such an ovary is against such a possibility. Also, as this pain is usually one-sided, and as there is rarely much difference in the size of the ovaries, it is difficult to explain why one should offend and not the other. But tradition teaches, wrongly as the writer believes, that these ovaries are offenders, and many an ovary has been partially or wholly sacrificed for that reason, generally without relief of the symptoms.

Medical treatment of this condition is only palliative. The use of tampons and pessaries, or rest in bed with the foot slightly elevated, sometimes gives relief for the time being. As in male varicocele, the only permanent cure is obtained by surgical means before or after the cause has been eliminated. The abdomen should be opened and the varicosities double ligated, and either excised or simply divided. Double ligation alone is efficacious, but there is the chance of the reëstablishment of continuity, which is absolutely prevented by excision or division.

Where there is doubt as to the exact diagnosis, an exploratory operation is justified. It is almost an axiom of modern surgery that when the evidences of a lesion, gained by a study of the symptoms and examinations, are not sufficient, an exploratory operation is demanded.

THE TREATMENT OF WOUNDS AND SUPPURATION OF THE JOINTS.

PAYR (*Münchener Medizinische Wochenschrift*, Jahr. 62, Nr. 39) states that differentiation must be made between benign, superficial suppuration of the joint (empyema) and grave, deep-seated phlegmon of the soft parts (panarthritis). In the latter there are necrosis and abscess-formation below the synovial membrane, resulting in extension to adjacent structures. The majority of cases of phlegmon are secondary to empyema of the joint, and to prevent this is the most important task in the treatment. In empyema of the joint breaking through of the pus into the deeper structure is favored by the anatomical peculiarities of the tendons and ligaments. Once broken through the pus is apt to burrow along the tendon sheaths and the connective tissue of the intermuscular spaces and spread far from the infected joint. Many joint infections have their origin in fragments of missiles which have penetrated the joint capsule and which are not at first observed by the surgeon. The joint shows infection after having run a quiet course for days. Even after sufficient incision and drainage the foreign body may give rise to reinfection; therefore, under all conditions, and at the latest when infection

manifests itself, the foreign body should be removed. Suppurating fractures in the region of the joint are also sources of joint infection.

In the treatment of infected joints the pus should be evacuated, the foreign body removed, and drainage carried out for a time. In empyema simple incision may suffice, but in phlegmon long-continued drainage by means of glass tubes is necessary. These should be placed in the dependent parts of the joint so as to best favor the outflow of secretion. After evacuation of the joint capsule the cavity should be injected with an antiseptic solution, as phenol-camphor, in order that it may not collapse too quickly and form adhesions.

In cases of phlegmon it is necessary to lay the joint open freely by cutting important ligaments and tendons. Chronic suppuration, especially in ball-and-socket joints, frequently necessitates late resection. In the after-treatment permanent extension gives the best results. In almost all the large joints perforation and spread of infection takes place in a definite manner owing to anatomical peculiarities, a knowledge of which will be of value in the treatment. The object of the treatment in suppuration of joints is to get finally a movable joint. This may be accomplished even in severe infections. Early movements of the joint are requisite to good results.

POSTOPERATIVE RENAL INFECTION.

WARD (*Surgery, Gynecology and Obstetrics,* October, 1915) calls attention to the frequency with which renal infection follows operation. The greater frequency of involvement of the right kidney is probably due to its greater mobility and its more frequent displacement, the drainage from that organ being less perfect in such cases, owing to kinking or looping of the ureter.

The preponderance of cases in females has been noted often, and is due probably to the fact that floating kidney is more common in that sex. Cotton also points out that the operation of decapsulation and drainage not only relieves the infection, but results in fixation of the kidney, and thus corrects the prolapse, which may have been a factor in the etiology.

Baisch states that while other bacteria may be the original factor in the production of the primary infection, they are supplanted by the colon bacillus; or that, if a mixed infection is present, the colon bacillus persists after the others have disappeared.

The common association of this disease with operations upon the intestinal tract, as for appendicitis, may account for the frequency of colon bacillus infections. Anything that causes a lowered resistance of the kidney makes it a suitable soil for the infection which is commonly passing through it by way of the urine, whenever infection is present in some part of the body. Undoubtedly the pyelitis of pregnancy and the puerperium is but a phase of these cases of kidney infection. The condition of pregnancy predisposes to the attack on account of the pressure by the gravid uterus on the blood-vessels and ureters, causing an increased congestion and less perfect drainage of the kidneys; and the ever-present colon bacillus in the neighborhood of the parturient canal and the frequency of parturient wounds supply the primary focus of infection.

There are three types of the infection, depending upon the degree of virulence—and the virulence naturally varies according to the particular organism—the condition of the kidney, and the general bodily resistance of the patient. They are:

Cases which are mild in character, the patient not being severely ill, which yield to the thorough flushing of the kidneys by the ingestion of water and formaldehyde, and which yield to proper diet and rest.

Cases in which the kidneys contain numerous septic infarcts, and minute or microscopic pus-foci, which are superficially situated in the cortex of the organ. Decapsulation or incision with drainage usually results in recovery.

The fulminating type, which is characterized by a profound toxemia, and which

is rapidly fatal unless a nephrectomy is done. Fortunately this type of the disease is usually unilateral.

The staphylococcus and streptococcus infections produce an abscess formation which originates in a terminal vessel in the cortex as a single focus. From this primary focus other portions of the kidneys become involved secondarily. As might be expected this type of the disease is the more severe. The colon bacillus produces a diffuse inflammation of the kidney which does not necessarily result in abscess formation or destruction of tissue. The kidney is enlarged, markedly congested, and infarcts are present. Microscopic examination of these areas of kidney-tissue may show the cells riddled with colon bacilli. This type of infection is less virulent than the former, and is frequently cured without sacrificing the organ.

As the less severe type of the disease is usually due to the colon bacillus, the presence of this organism in the urine gives rise to a characteristic appearance. The urine is turbid or cloudy, and remains so on standing. This is due to the motile power of the bacilli, which keeps them in constant motion and thus prevents them from sinking to the bottom of the glass as other organisms do, with the exception of the proteus hauseri.

Urine containing the colon bacillus is nearly always of an acid reaction. Marked irritability of the bladder is present due to the discharge of pus thereinto. This irritability, as manifested by frequency of micturition and dysuria, is often an early sign of the onset of the disease, and the author believes that many cases in which the nurse has been held responsible for a supposed cystitis, due to carelessness in using the catheter, are really due to a renal infection of hematogenous origin.

In the treatment of mild cases of infection of the kidney the indication for conservatism is not disputable, and in the fulminating type with the presence of abscesses we have no choice but a prompt nephrectomy. But the proper treatment of the second type of the infection cannot be so clearly defined. Much depends on the progress of the disease in each individual case, and to decide correctly when to operate and when not to operate calls for the exercise of great care and thoroughness in considering all the factors, and sound judgment in weighing their relative value. The general principle governing the line of treatment should be that of conservatism coupled with a sharp watchfulness for signs and symptoms indicating that the point of toleration to toxic absorption has been reached by the patient, the result of lowered resistance caused by the progress of the disease.

At the outset, palliative measures such as rest, a simple and unirritating diet, the ingestion of large quantities of pure water, with the employment of urotropin or other urinary antiseptics, should be instituted and maintained so long as the resistance of the patient is equal to the task of combating the toxemia. Should the limit of the patient's ability to resist the disease be approached, as shown by the blood count and a continued high range of temperature and increasing pulse-rate with evident progressive loss of strength, operative interference is indicated.

It is important in employing urotropin to give a sufficient quantity to insure the presence of formaldehyde in the urine. As has been pointed out by Burnham, it is necessary to test the urine frequently for formaldehyde to be certain that it is being liberated. The usual dosage of five to ten grains three times daily is rarely sufficient, and it should be increased up to twenty- or thirty-grain doses if necessary to show the drug in the urine. As the antiseptic power of urotropin is not manifested in alkaline or neutral urines, the acidity should be assured by giving acid sodium phosphate.

If operation is necessary, nephrectomy should not be done unless the indications for it, as shown by the appearance of the kidney, are positive. A decapsulation or nephrotomy with drainage is sufficient in many cases, as shown by numerous reports, especially in the colon bacillus infections.

Lilienthal was probably the first to do a

nephrotomy in a septic kidney. He reported a striking case of bilateral hematogenous infection with recovery following a double nephrotomy in 1896.

THE PREVENTION OF PERITONEAL ADHESIONS.

PRIBRAM (*Archiv für klinische Chirurgie*, Bd. 105, Heft 2, 1914) reports upon experiments carried out in Payr's clinic with a view to prevention of peritoneal adhesions. The material used consisted of the vitreous humor of the eyes of sucking calves obtained under aseptic precautions at slaughter-houses. The experimental animals were dogs, cats, and rabbits. It was first shown that the vitreous humor did not produce anaphylaxis, fever, or any other disturbance, and that its introduction in large quantities into the peritoneal cavity was well borne by the animals. The experimental animal was etherized, the hair shaved, and the skin washed with ether, alcohol, and tincture of iodine. A median-line incision was made, and at once the peritoneum sutured with continuous silk suture, the muscle and fascia with catgut, and the skin with silk. The line of sutures was painted with tincture of iodine and an aseptic dressing applied. Then the vitreous was injected into the peritoneal cavity. Control animals were used in each instance. The effect of the vitreous is to render the peritoneum very slippery and to gradually spread over the entire surface. Primary adhesion is either entirely prevented or at least very much reduced, as shown by comparison with control animals. It will not prevent adhesions as a result of infection or wide-spread chemical action.

REVIEWS.

A TEXT-BOOK OF THE PRACTICE OF MEDICINE. By James M. Anders, M.D., Ph.D., LL.D. Illustrated, 12th Edition, Thoroughly Revised. W. B. Saunders Company, Philadelphia, 1915. Price $5.50.

When twelve editions of a book have appeared in eighteen years, and it has been reprinted a number of times, it may be fairly presumed that a large number of the profession are thoroughly familiar with its quality, and another fair presumption is that it must have proved valuable to those who have purchased it in previous years. In the present edition a number of important articles have been rewritten, or added to, as, for example, those on Diabetes Mellitus, Gastroenteroptosis, Acute Anterior Poliomyelitis, Splenomegalia; otherwise, the additions which are named in the preface do not seem to be of importance.

The paper used by the publisher is so thin that the hue of the ink on the other side is perceptible, which is annoying to the reader.

The book has always been characterized by the use of tables employed for differential diagnosis, and as it is written by a practicing clinician there is a full recognition of the needs of the man working at the bedside. In some chapters a considerable number of foot-notes are appended as to literature which the author thinks is important.

We note with interest that the author thinks that creosote has found a new field of usefulness in the treatment of the fever of tuberculosis, thinking that its use in these cases cures a gradual diminution of febrile movement. We confess that we have never seen such results accrue. We also question whether it is fair to speak of mineral acids and zinc oxide as antipyretics. Surely none of these ever act as true antipyretics and are not to be classed with phenacetine and acetanilide. So, too, we have never been able to see that zinc oxide taken internally will stop sweating. We regret that camphoric acid as a remedy for sweating in tuberculosis is not mentioned. The directions that formalin may be inhaled in pulmonary tuberculosis without a definite statement as to how weak the solution is from which the formaldehyde gas is obtained, might, in the hands of the inex-

perienced, cause a severe bronchitis. Quoting Stengel as having recommended the hypodermic injection of camphor as a stimulant in typhoid fever is correct, but as a matter of fact Graves of Dublin, long before Stengel was born, employed this drug for this purpose with excellent results. We are sorry to see that the author refers with favor to the gradual cool bath. This bath does not produce reaction, and reaction is what is desired. On the other hand, we cordially indorse the writer's condemnation of the ordinary antipyretics in these cases. So, too, we are heartily in accord with the author in the belief that turpentine is a useful drug in the later stages of this disease.

In discussing the subject of hemorrhage in typhoid fever we note, with surprise, the statement that if the blood has a poor agglutination reaction, phlebotomy to the extent of about 10 ounces may be practiced. We fail to see how such advice can be advantageous, as agglutination has nothing to do with coagulation, and even if a patient has not lost a great amount of blood in one hemorrhage, he can ill afford to lose blood through venesection with the prospect of other hemorrhages before him.

In discussing the wiring operation upon aneurism it is interesting to note that the author does not quote from those who have performed this operation most frequently in this country, but from those who have reported only a very few cases. Care is not taken to describe the fact that gold wire should be used, and the statement is made that the operation is not without serious danger in view of hemorrhage or embolism. To the best of our knowledge neither of these accidents has ever occurred if the operation has been properly done and where the case was properly chosen, or, in other words, has been a sacculated aneurism. Nor has any other accident occurred during or immediately after the operation which would justify an opinion that the operation in itself is dangerous, considering the grave condition which is present.

The author has succeeded in crowding within the covers of the book an extraordinary amount of information derived from literature and from his own personal experience, and it is a credit to him as a useful, practical piece of work.

YOUR BABY. A Guide for Mothers. By Edith B. Lowry, M.D. Forbes & Company, Chicago, 1915. Price $1.00.

As may be imagined the intention of this book is to instruct young mothers in the care of their infants.

Altogether there are 16 chapters. The first eight of these deal with the Mother During Pregnancy and After Childbirth; the last eight deal with the Baby.

We are inclined to think that the first eight chapters are qualified to do quite as much good, if not more, than the last eight, since there are many books upon the care of the baby and very few upon the care of the expectant mother. We think that far too little emphasis is laid in the chapter upon the Accidents of Pregnancy, upon the gravity of edema, and evidence of renal involvement. It is true that a patient is advised that when there is any diminution in the amount of urine passed, or upon the appearance of any swelling of the feet and ankles, to consult a physician, but the authoress might have added that not only is this advice wise, but it is essential that it be followed. There are few conditions met with in medicine in which so much can be done in the way of prevention, and so little can be done in the way of treatment, as in eclampsia.

In the preface of the book certain facts are stated which are of interest, if they are true, as, for example, that in postmenstrual conception the child is more likely to be a girl and in antemenstrual conception a boy. Some evidence is given that the authoress believes in the effects of maternal impression in producing sex. The authoress seems to believe, too, that the excess of female births over male births is due to the inertia of the parents or to the unhygienic laws of our social life, whatever this may mean.

We have repeatedly, in these pages, called attention to the difficulty of a medical author preparing text which could be recommended to the lay mind without deal-

ing too lightly with some subjects and too strongly with others, and without giving erroneous impressions to those who are not thoroughly familiar with technical matters. The authoress of this book has written a number of other volumes of semimedical nature, one of them being "Talks with Men Concerning Themselves," another "Talks with Women Concerning Themselves," "Talks with a Boy Concerning Himself," "False Modesty, and Teaching Sex Hygiene in the Home," and another entitled "Confidences, or Talks with a Young Girl Concerning Herself."

A TEXT-BOOK OF PHYSIOLOGY. For Students and Practitioners. By William H. Howell, M.D., Ph.D., Sc.D., LL.D. Sixth Edition, Thoroughly Revised. W. B. Saunders Company, Philadelphia, 1915. Price $4.00.

That six editions of Dr. Howell's very excellent book on Physiology should have appeared within ten years is evidence that it is appreciated by teachers, students, and practitioners, the more so as it has been reprinted several times during this decade. Naturally, most of the alterations in the text are to be found in the chapters dealing with Nutrition and Internal Secretion. A large part of these chapters has been rewritten. As the author points out, these subjects have their intricacies increased rather than diminished by investigation, and it is more, rather than less, difficult now, than it was a decade ago, to present a fair summary of the numerous facts and hypotheses bearing upon this topic.

As the book stands it covers a little over 1000 pages, fairly closely printed and excellently illustrated. As in previous editions, important contributions to physiology are marked by references in foot-notes.

Aside from the chapters upon Nutrition and Internal Secretion, we think that the general reader will find most interest in those devoted to the Circulation and Nervous System. The advances in our knowledge of the circulation have been almost as great as our advances as to the influence of glands, and he who studied physiology twenty years ago will recognize quite a different science in the physiology which is presented to-day by Dr. Howell. Too frequently the busy practitioner allows his knowledge of physiology, pathology, and anatomy to become dwarfed and stale by reading books which deal directly with his practice and ignoring those works which present to him the latest conceptions or knowledge of physiological and pathological processes. He will get an interesting view and summary of modern physiology if he will read these pages.

POST-MORTEM EXAMINATIONS. By William S. Wadsworth, M.D. Copiously Illustrated. W. B. Saunders Company, Philadelphia, 1915. Price $6.00.

This volume had its birth by reason of the fact that Dr. Wadsworth has been for many years Coroner's Physician in Philadelphia.

It contains illustrations as to the methods which are employed in the making of autopsies, the Methods of Handling a Knife, of Weighing Parts, of Obtaining Cultures, and minute details as to the incisions and dissections which are necessary for the proper discovery or examination of lesions produced by disease or injury. Every page of the book gives evidence of the author's intimate knowledge of the subject with which he is dealing. Indeed, the text differs from that of many volumes in that the author uses the personal pronoun very constantly.

The book can be recommended as an able presentation of this subject to coroners, physicians, teachers of pathology and morbid anatomy, and to students of medicine, and it will prove interesting to all those officers of the law, medical or otherwise, that have to deal with medicolegal matters.

One of the interesting parts of the book deals with death from electricity, and another, which is particularly interesting at the present time, is that which discusses death from gunshot wounds.

PRACTICAL PRESCRIBING AND TREATMENT IN THE DISEASES OF INFANTS AND CHILDREN. By D. M. Macdonald, M.D., F.R.C.P.E. Oxford University Press, New York, 1915.

Although the title of this little book is long, its contents are short, covering less than 200 pages. It describes the treatment which the author thinks should be used in

most of the common infections of childhood, the diseases being arranged therapeutically. The opening pages deal with a dose list and are followed by five pages in which diet is discussed. There are a number of diseases mentioned which are so rare in children as hardly to deserve a place, as, for example, migraine and ascites. Ascites, of course, is never a disease, and when it occurs in children is due to cardiac or renal disease, or to tuberculosis. So, too, condylomata must be a very rare condition in little children. The same thing holds true in regard to Bell's palsy. Nevertheless, notwithstanding these suggestions or criticisms, the book has many little tips or points which busy practitioners may find useful.

The description in detail of the employment of tuberculin as a diagnostic agent by hypodermic injection in children is, we think, unnecessary and unwise. Surely this is a type of case in which tuberculin should not be given by hypodermic injection for diagnostic purposes. Should a tuberculin diagnostic test be desired the Morro or von Pirquet reactions are certainly adequate.

A MANUAL OF PATHOLOGY. By Guthrie McConnell, M.D. Third Revised Edition, Illustrated. W. B. Saunders Company, Philadelphia, 1915. Price $2.50.

In preparing the first edition of this Manual of Pathology in 1909 Dr. McConnell recognized the fact that we already had a number of exhaustive treatises covering from 800 to 1000 pages, and that there was room for a smaller manual, freely illustrated, which would suffice to give the student practically all the information that he needs in studying this department of medical learning. Although three editions have appeared in the nine years since the book came out there have, nevertheless, been several reprintings.

The illustrations are far better than those commonly found in books of this character. Every definition is clear, and they are at once sufficiently true to nature and yet sufficiently diagrammatic to be interesting and instructive. Much attention must have been given to the press-work in order to make the black-and-white illustrations so clear.

From what we have said it must be evident that the book is not intended as an exhaustive manual, but rather as a summarization, not so condensed as to be like a quiz book, and yet not so diffuse as to be difficult to study. Any student who will faithfully study these pages will be amply rewarded by the accuracy of his knowledge.

MEDICAL HINTS FOR THE USE OF MEDICAL OFFICERS TEMPORARILY EMPLOYED WITH TROOPS. By J. Edward Squire, M.D., F.R.C.P., D.P.H. Oxford University Press, New York and London, 1915.

The object of this volume is clearly described in its title. It covers a little over 100 pages, and deals in 14 chapters with Acute Infections, with Diseases of the Digestive and Respiratory System, the Heart, Rheumatism, Tonsillitis, Body Parasites, Frost-bite, Gassing, Arsenical Poisoning, Effects of Tobacco and Alcohol, Malingering, Marching, and Discipline in Hospitals.

It will interest our readers to know that in the discussion of the subject of Tobacco, although the author recognizes the fact that its too free use may impair a man's marching powers, he says that, on the other hand, the soldier seems to get so much satisfaction and solace from it that to restrict it, to what might be considered healthy limits, possibly outweighs the disadvantages of excessive consumption; although there might be some gain in health, the net result would be a loss in efficiency. And, again, smoking becomes a part of the life of a soldier in the field; to deprive him of this is to inflict a hardship.

THE CARE OF THE BABY. By J. P. Crozer Griffith, M.D Sixth Edition, Thoroughly Revised. W. B. Saunders Company, Philadelphia, 1915. Price $1.50.

Twenty years have elapsed since the first edition of this book appeared. During that time it has been reprinted on a number of occasions. Each time a new edition has come from the presses we have reviewed it in these pages in terms of praise. Written by one who is well qualified to deal with this important subject, it provides the nurse and mother with much useful information in

regard to what they should do for children in their care. The difficult problem of preparing text for the laity has been as well met as it is possible to meet it.

THE PRACTICAL MEDICINE SERIES. Under the Editorial Charge of Charles L. Mix, A.M., M.D. Volume 6: General Medicine, Edited by Frank Billings, M.S., M.D., and J. H. Salisbury, A.S., M.D. Series 1915. Year Book Publishers, Chicago.

In previous years we have referred to this book, which is designed to present a summarization of medical literature during twelve months. It is a small volume of over 300 pages containing a number of illustrations, giving the references to the literature which is quoted. The contents are arranged: First, Infectious Diseases, then Diseases of the Alimentary Canal and the Liver and Gall-Bladder and the Pancreas. We do not find in the table of contents any reference to diseases of the respiratory or circulatory system, nor to the genitourinary tract.

THE MEDICAL RECORD VISITING LIST OR PHYSICIAN'S DIARY FOR 1916. William Wood & Company, New York, 1915.

Year after year we have noticed the appearance of this excellent visiting list, which is used by medical men as an indispensable part of their records.

Its first 31 pages are taken up with a large amount of information which is supposed to be of use to the physician, as Doses, Lists, Metric and Apothecary Equivalents, Methods of Performing Artificial Respiration, Treatment of Emergencies, and, last of all, Hints on the Writing of Wills. Following these are blank spaces for the recording of Visits to Patients, Consultations, Special Memoranda, and Cash Accounts.

CEREBROSPINAL FEVER. By Thomas J. Horder, M.D. Oxford University Press, New York and London, 1915.

This little book is one of a series containing less than 200 pages, which has evidently had its origin in the increased prevalence of cerebrospinal fever because of the great European war. The rest of the series deal with other topics cognate in medicine or in surgery. By its aid it is hoped that the army and navy medical officers in the English service will be able to diagnose and treat such cases early and with skill.

Full credit seems to have been given to Flexner for his investigations, both experimental and clinical.

As a brief summarization of an important subject the book can be commended.

The general practitioner in this country whose library is well equipped with first-rate works upon the practice of medicine will not require it.

THE AMERICAN MEDICAL DICTIONARY. By W. A. Newman Dorland, A.M., M.D. Eighth Edition, Revised and Enlarged. W. B. Saunders Company, Philadelphia, 1915. Flexible Leather, $4.50; Thumb Index, $5.00.

It is not necessary to attempt to review the eighth edition of Dorland's Medical Dictionary, which has become one of the standard medical dictionaries in the English language, and is recognized as such not only in this country but abroad.

The present edition is a large octavo volume of 1135 pages, with 331 illustrations, 119 of which are in colors, and it contains more than 1500 terms which were not in earlier editions. As in past issues, it contains many tables whereby an immense amount of information is put in condensed form. The book is one which we constantly refer to. We need not recommend it. All that is necessary is to call attention to the fact that, by means of a new edition, the author has brought his very noteworthy contribution to medical book-making thoroughly up to date.

AN INTRODUCTION TO BACTERIOLOGY FOR NURSES. By Harry W. Carey, A.B., M.D. F. A. Davis Company, Philadelphia, 1915. Price $1.00.

Some time ago, in calling attention to a book of this nature, we raised the question as to how much need there is for a nurse to study even the elementary principles of bacteriology, aside from the instructions which she may receive in antisepsis and asepsis. Whatever may be the opinion of others in regard to this matter, it can be said of this book that the author takes care not to go too deeply into his subject, giving

the nurse just about what she should know concerning bacteriology, if she is to know anything of this science.

The book is interleaved with blank pages for notes which the nurse may choose to make to aid her when studying the theme presented by her lecturer in her training school.

As a book which will enable the nurse to act in the physician's laboratory as his assistant, by making bacteriological examinations, it cannot be commended. It is rather a work for the pupil nurse than for the graduate nurse, and does not profess to go deeply into this subject.

WOUNDS OF THE THORAX IN WAR. By J. Keogh Murphy, M.C. (Cantab.), F.R.C.S. Oxford University Press, London, 1915. Price $1.00.

The author states that he was asked by the Editor of this series to write a short practical account of wounds of the thorax received in war for those who have begun the art of repairing wounds inflicted by their "brethren." He gives in this small brochure the result of his own personal experience as well as that of those with whom he has been brought in personal contact.

In the chapter devoted to The Causes and General Clinical Features of Wounds of the Thorax in War, observations made on the bayonet wound show that it is septic from the beginning and hemorrhage is severe. Shell wounds of the chest are wide and ragged. The hand grenade causes much the same wounds as those due to shells. The modern bullet wound of the soft tissues is eminently a merciful one; if the bullet ricochets or hits some hard substance in the patient's pocket it is quite otherwise, the wounds becoming septic throughout. As to the thorax, the lung wound in itself does but little damage. Indeed, within three or four days of the injury it would be difficult to find post mortem the actual track of the bullet through the lung. Shrapnel bullets do not penetrate far. They produce jagged, painful wounds which are always septic. Immediate death from wounds of the thorax is by no means as common as might be imagined. There are grounds for believing that even perforations of great vessels are not uniformly fatal. The amount of shock entirely depends upon the amount of damage done to the thoracic wall, having no reference to the injury to the lung. There is little pain connected with the infliction of such wounds. There is temporary dyspnea, which soon passes off. Hemoptysis is not common. The idea of immediate treatment is to put the patient and his chest at rest, a hypodermic of morphine, with atropine, ½, ⅔, or even a whole grain being advised. He should be given plenty of water to drink.

There follow chapters devoted to varieties of wounds of the chest, later effects produced by penetrating wounds, Pyothorax, Pneumothorax, Gunshot Injuries Involving the Thorax and the Upper Abdomen, Surgical Treatment of Wounds of the Thorax, Rarer Septic Complications, Bacteriological Therapeutic Methods.

A thoroughly interesting, readable brochure bearing upon every page the mark of a large experience is that reviewed.

NERVE INJURIES AND SHOCK. By Wilfred Harris, M.D. (Cantab.), F.R.C.P. (Lond.). Oxford University Press, Henry Frowde, London, 1915. Price $1.25.

The distinguished author states that an outstanding feature of the casualties in the present war is the very large number of cases of nervous exhaustion, neurasthenia, and functional paralyses of various kinds which are being met with. With proper suggestive treatment cases of nervous shock can be immediately or completely cured.

The first chapter begins most entertainingly, the author pointing out with singular lucidity that "injuries to the brain are the result of violence varying in extent and character according to the weapon and the force of the blow; thus injuries may be inflicted by violent contact with a hard, blunt instrument, such as a paving-stone, or against a wall; by a heavy semisolid vessel, such as a sandbag (an American hooligan method of attack)."

As to the treatment of cerebral injuries the most important point is "to avoid doing too much." For at least six hours after an

accident involving injury to the brain the author urges against "administering restoratives in the shape of food or brandy poured into the mouth." He insists that the clothes should be cut off. Nor should the scalp be sutured for several hours after securing bleeding points.

There is a discussion of fracture dislocation of the spinal column and a brief but good section on Brachial Plexus Injuries. Neurasthenia incident to nervous shock is treated by suggestion and psychanalysis.

THE STRETCHER BEARER. By George M. Dupuy, M.D. Oxford University Press, Henry Frowde, London, 1915. Price $1.00.

An excellent book, profusely and most intelligently illustrated. A manual for both physician and layman who would be familiar with the methods of lifting, transporting, and handling injured people. The legends after each illustration are so descriptive that any intelligent person can apply them to himself or to a group wishing to obtain training in this direction.

GUNSHOT INJURIES OF BONES. By Ernest Hey Groves, M.D., M.S. (Lond.), F.R.C.S. (Eng.). Oxford University Press, Henry Frowde, London, 1915. Price $1.25.

This book, written in the hurry and stress of active military service, emphasizes certain general principles regarding bone injuries. The author urges against the mistake of doing too little, speaks of "a light caressing touch" in the treatment of fractures, argues with much discretion the subject of operation, and describes and pictures some ingenious and serviceable dressings. The reviewer feels that this book may have been written by request rather than because the author was touched by a divine enthusiasm to give to the world newly discovered truths.

ABDOMINAL INJURIES. By Rutherford Morison and W. G. Richardson, M.B., F.R.C.S. Oxford University Press, Henry Frowde, London, 1915. Price $1.00.

This book is written for the purpose of aiding medical men who may be called upon to act in emergency, and whose knowledge of abdominal surgery may have grown somewhat rusty. If a fair concept of its purpose be borne in mind none but favorable criticism can be accorded the work. There seems, however, no good reason for giving the details and technique of abdominal operations in a work such as this; every reason for describing transfusion, enteroclysis, and other life-saving measures. The distinguished authors state that after the third day some patients continue to retch and bring up mouthfuls of what they have swallowed. "A glass of champagne with a little food, such as a raw meat sandwich, will sometimes put an end to this trouble."

About half the book is devoted to a description of major operations which in the hands of the inexperienced are likely to be far more fatal than the injuries for the relief of which they are performed.

SURGERY OF THE HEAD. By L. Bathe Rawling, M.B., B.C. (Cantab.), F.R.C.S. (Eng.). Oxford University Press, Henry Frowde, London, 1915. Price $1.25.

A chapter devoted to Applied Anatomy, 35 pages; Injuries to the Scalp and Brain discussed in a perfunctory style. Chapters devoted to Fractures of the Vault showing a fairly well-digested summary of text-book literature. Indeed, there is little to condemn or to praise in this volume.

INJURIES OF JOINTS. By Robert Jones, Ch.M., F.R.C.S. (E. & I.). Oxford University Press, Hendry Frowde, London, 1915. Price $1.25.

An excellent manual containing much that is potentially but not essentially military and a model of what an educational handbook for the profession should be. That it is called a war primer does not lessen its value.

WOUNDS IN WAR: THEIR TREATMENT AND RESULTS. By D'Arcy Power, M.B. Oxon., F.R.C.S. Eng. Oxford University Press, Henry Frowde, London, 1915. Price $1.00.

Some good strong words from a man who has been there, seen, and done. Not largely helpful, since help to the individual can only come through personal experience, nor does it seem possible to pass this on in books. A thoroughly readable and instructive work. A chapter devoted to Vaccine Treatment of Wounds, perhaps in accordance with the

fashion of the day. A small section on Ligature of Arteries suggesting an ordinary text-book. An interesting section on Tetanus and Gas Gangrene.

It is somewhat amazing to find that the author states that when a limb is affected by gas gangrene infection amputation high up affords the best chance of recovery. Perhaps his manuscript was submitted to the printer many months since.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

During the past fortnight we have experienced a considerable change in the climatic conditions which prevailed in the preceding month. Instead of warm weather with a number of wet days, we are now experiencing a fine spell with cold weather and nocturnal frost. In London at all events we have not had much wind. The effect of the early frost is shown in the country by the early fall of the leaf, and the trees have now for some weeks been practically denuded of the leaves, which generally remain on the trees until the present date.

It is interesting to be able to learn from those who return from abroad some few details of the conditions in France. I was told a few days ago that the weather over here is very much colder than it is in France, but on the other hand the wet over there is greater than it is here. One of the "flying men" told me that he had of late been flying in a temperature of 12 down to 0 degrees Fahrenheit, and that he had extreme difficulty in keeping warm. This was felt especially in the feet and hands. For the latter he wears three pairs of gloves, silk, kid, and finally fur-covered gauntlets, but he was constantly finding his hands dead, and that, too, in spite of the fact that his peripheral circulation presented no abnormalities.

The cases now being admitted to hospital show a certain amount of similarity to those admitted this time last year. There are a number of trench feet, but these on the whole are not so severe as those of last winter. With a greater number of men, it is apparently easier to evacuate cases while they are comparatively mild than was the case twelve months ago. This condition of trench feet is not to be regarded lightly, as I still have under my care two cases from last autumn which have not completely recovered. In both instances the patients complain of pain on pressure under the big toe, and between the metatarsophalangeal articulations of this and of the second digit. As a result they are unable to bear the weight of the body on this part of the foot, and persist in walking with the foot inverted, so that the weight falls on the outer part of the sole. Any considerable amount of walking produces pain in the tibialis anticus muscle. There recently also came under my care a private who in civil life had been a laborer, who was suffering from a subacute attack of gout involving the dorsum of the left hand. I attributed the condition in this case largely to a change of diet. Whereas formerly he had been accustomed to meat two or three times a week, in the army he gets meat certainly more than once every day. Another type of case which is extremely satisfactory, and of which I have now met four or five cases, is one of complete or almost complete paraplegia, due to trauma in the region of the spine. In one case the spine of one of the vertebræ and probably one of the lamina had been knocked off. I did not see this patient till some five weeks after the injury. The report, however, states that he had been completely paraplegic, both arms and legs being involved, and cystitis being present. The latter remained, but he is now, six months after injury, practically well, is able to walk, and can move his hands and arms freely, and improvement is noticed week by week. In another case the bullet had apparently passed through the body of one of the

vertebræ. This man recovered completely, except that in one foot the extensor toe response remained. I believe, however, that this will finally disappear. I have not thought it advisable to draw off cerebro-spinal fluid in these cases, though such an investigation might have revealed traces of hemorrhage had it occurred. In yet another case, where the bullet had evidently passed anteriorly to the vertebral canal and seemed to have injured the body of the vertebræ, the legs escaped though the arms were temporarily completely paralyzed. This man recovered completely, with the exception of a little diminution in the freedom of the side-to-side movement of the head. We also meet with a number of cases of peripheral nerve injury, either directly by the bullet, or secondarily by the involving of the nerves in scar tissue.

At the Royal Society of Medicine, early in the month, a discussion on paratyphoid fever was opened by Sir Bertrand Dawson. It was especially interesting because he was able to show some of the pathological lesions associated with the disease. Among these specimens were some showing perforation in the ileocecal region, and abscess of the spleen. Otherwise, owing to the fact that papers have already been published on this subject, the opener had no opportunity of producing any very new material. He was followed by Dr. Dreyer, who gave a dissertation, perhaps unnecessarily long, on the results of blood culture in early stages, and of the Widal reaction in this disease, and in the case of genuine typhoid fever. The gist of his remarks was to the following effect: Since the army has been very well inoculated, one positive Widal test does not give any indication or proof of the presence of the specific disease, even though clumping may occur in high dilutions. It is, therefore, necessary to repeat this observation three or four times. If the patient is suffering from typhoid or paratyphoid the agglutination reaction will show marked variation in intensity from time to time with an upward tendency, whereas if he is not so affected the variation will be small and will have a tendency to be weaker on each successive investigation. The audience was more interested in the condition known as trench fever. This subject was introduced on a chart shown to illustrate the difference between a paratyphoid attack and trench fever. Sir W. Herringham, who was present, would not say very much upon the subject, because he was cognizant of a paper written by one of his coworkers, which was then in the press. This paper, by Captain Hunt and Major Rankin, gives a full description of the disease. The authors have not been able to throw light on its pathology. The discussion is to be continued.

As time goes on we are introducing a number of labor economies. One which has recently come to my notice replaces the old horse-drawn brush-roller street-sweeper, which used to travel at the rate of approximately three miles an hour, employing a driver and a fairly heavy type of horse. We now have a motor sweeper on the same principle, which moves at ten or twelve miles an hour. It forces itself on one's attention by a rather loud buzzing sound, which rises and falls as it approaches and passes, but is not at all unpleasant. It is at present driven by a man, but the innovation will be accentuated if and when the sex of the driver is changed.

Women are more and more taking the places of men. Their presence is most noticeable in such public places as railway stations and ticket offices. They are also acting as paper sellers, and have even invaded the ranks of the professional window-cleaner, but I understand that some of the public object to their presence in the latter capacity. There is one quite regular incident in connection with the papers which reminds one of similar occurrences at the time of the Boer war. A special edition of one of the Sunday papers is issued on Sunday evening, and it is a peculiar fact that the call boys, who on that night, and only that night, invade residential quarters, are always able to announce some big Allied success. The public, however, have long become wary, and I fear their business enterprise is suffering a setback.

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ORIGINAL COMMUNICATIONS.

THE MODERN METHOD OF TREATMENT OF DISEASES OF THE STOMACH.[1]

BY JULIUS FRIEDENWALD, M.D.,

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When your secretary requested me to present a paper on "The Modern Method of Treatment of Diseases of the Stomach from the Standpoint of the General Practitioner" to your Association, I consented with some reluctance, for I at once recognized the difficult task set before me. The treatment of any disease, especially of the stomach, presupposes a thorough knowledge of the disease at hand, and this is not always a simple matter, for a correct diagnosis is often most difficult and at times impossible. The treatment follows the diagnosis directly, and most of our therapeutic failures are due to inaccurate diagnoses. It is therefore of the utmost importance to examine all of our patients affected with gastric disorders most thoroughly, and to exercise every precaution to reach correct diagnoses. It is only under these conditions that the treatment may be so instituted as to prove most effective, and of the greatest benefit to the patient.

The specialty of gastroenterology really dates as far back as the beginning of the eighteenth century, when the stomach-tube first saw the light of day. There has been much discussion as to the priority of the discovery of the stomach-tube, and the view has been generally accepted that this instrument is of English origin, and that the two English surgeons, Jukes and Bush, are its inventors. This claim is based on an article by Jukes in the London Medical Repository of 1822. He here described an elastic tube one-quarter of an inch in diameter and two and a half feet in length, terminating at one extremity in a small globe of ivory with several perforations; the other extremity being adapted either by screw or plugs to an elastic bottle of sufficient size to contain at least a quart of liquid, and having a stop-cock fitted to it. Instead of the bottle a syringe of an equal capacity could be adapted in the same manner to the flexible tube.

Some years ago, in looking over some old medical volumes, my attention was attracted to the fact that the credit of this discovery is due to Dr. Physick, who published his original paper October, 1812, in "The Electric Repertory," Vol. III, page iii, under the title of "Account of a New Mode of Extracting Poisonous Substances from the Stomach, by Philip S. Physick, M.D., Professor of Surgery in the University of Pennsylvania," which is ten years prior to the appearance of Jukes's article. He declares that he employed the tube in washing the stomach of twins three months old who had accidentally been given an overdose of laudanum by their mother. He employed a large catheter for this purpose. One of the children was saved, the other died. Physick states that the idea of washing out the stomach with a syringe and tube in cases in which quantities of laudanum or other poisons had been swallowed occurred to him at least twelve years before, and he had constantly for many years recommended it in his lectures. In the year of 1809 his

[1] Read by invitation at the meeting of the York County Medical Society (Pennsylvania), Nov. 4, 1915.

nephew Dr. Dorsey practiced lavage in a case, but the patient had swallowed the poison twelve hours before he was called, so that he did not succeed in saving life. But the tube was soon forgotten, and was not generally employed until after 1869, when Kussmaul suggested its use in the treatment of gastric dilatation.

No one who is especially interested in the treatment of diseases of the stomach should fail to read that most important article, "Uber die Behandlung der Magenerweiterung durch eine neue Methode mittest die Magenpumpe," by Kussmaul, in the *Deutsches Archiv für klinische Medicin* in 1869, in which a most ingenious method of treatment laid the foundation for an exact mode of diagnosis in gastric disturbances. In this valuable paper Kussmaul tells of the difficulties besetting the treatment in advanced forms of dilatation of the stomach due to narrowing and closure of the pylorus. "Very exceptionally was it possible to obtain any results in the treatment of this dreadful disease. As a rule it may hardly be possible ever to expect an amelioration of the symptoms, and never possible to produce a cure." Kussmaul, who was director of the Freiburg Medical Clinic, was rather reluctant in admitting to his clinic a country girl, Marie Weiner, twenty years of age, who had been troubled with gastric disturbances for eleven years, and in whom he found a typical example of dilatation of the stomach, produced by stricture at the pylorus due to ulcer. The patient was very pale and emaciated, and so weak as to be unable to leave her bed; she suffered greatly from vomiting of extremely large quantities; from gastric pain, sleeplessness, and attacks of tetany, and was relieved of her suffering only by means of morphine. Kussmaul says: "Often when I observed the patient in the wretched prodromal stage of vomiting the thought had occurred to me that I might relieve her suffering by the employment of the stomach-pump, as the removal of large masses of decomposed acid gastric contents should cause relief from agonizing burning and retching at once. The introduction of the sound could be performed without difficulty, for where a gastric dilatation has existed for so long a period of time the esophagus is usually dilated. The artificial emptying of the stomach by the pump could be no more painful or distressing than the condition existing before and during vomiting; at any rate, its effect would be more rapid and complete than the emptying of the stomach by means of vomiting, with its prolonged prodromal stage of nausea, pain, and retching. Often, even after vomiting, palpation and percussion indicated that the stomach still contained considerable masses of contents. This condition reminded me of the so-called ischuria paradoxa, in which large amounts of urine flow daily from the dilated bladder without its actually emptying itself and without reducing its size. By means of the pump it is possible to empty the stomach completely, and, if its elastic and contractile powers have not been entirely lost, perhaps even give to it the tone to contract to a certain degree, as the catheter occasionally brings about recovery in ischuria paradoxa.

"In our patient the gastric dilatation was occasioned by stricture at the pylorus. At the post-mortem examination of cases of extreme gastric dilatation, I have repeatedly found that the stenosis which was present would still admit the passage of a small finger from the stomach into the duodenum, although there had appeared to be complete closure of the pylorus towards the end of life. In such cases I had at times observed at the bedside through the abdominal walls active movements of the stomach. It appeared to me as though the excessive distention, the filling and overloading of the stomach itself, produced a mechanical action which increased the constriction of the pylorus to complete closure. I was desirous of removing this condition by emptying the stomach and decreasing its size. Finally, it appeared to me that the use of the stomach-pump would permit a more thorough treatment of the diseased gastric mucous membrane than was ever before accomplished. In the case of our patient this had for 2½ years been constantly irritated by extremely acid contents. The

stomach-pump would not only make it possible completely to evacuate these acid acrid masses, but would permit the washing and cleaning of the diseased mucous membrane, which had been irritated by acids with alkaline fluids, as with Vichy water or with an artificial soda solution. The introduction of the stomach-tube, the pumping out, and washing with Vichy water were usually easy. We withdrew three liters of acid, dirty-gray, sarcina-containing fluid, with particles of food of all kinds undergoing softening and decomposition." This was first accomplished on July 22, 1867.

Although most enthusiastic over this new method of treatment, Kussmaul realized its limitations. He recognized that only where slight constriction of the pylorus existed was he able to cure cases of dilatation of the stomach by lavage. In cases of malignant stenosis of the pylorus and marked cicatricial contraction relief only could be afforded, and not cure. He says: "Naturally it is impossible to expect a cure of a dilated stomach by means of lavage when the pyloric orifice is narrowed to such an extent that it will hardly admit even as much as a goose quill." It is here that Kussmaul points out the possibility that surgery may at some future day bring relief to these cases, and it is possible, as Fleiner suggests, that perhaps it may have been the inspiration of this remark that led Billroth at a not very distant date to attempt to cure incurable forms of gastric disease by surgical measures. Thus a new method of treatment, this epoch-making work of the great master Kussmaul, furnished the impetus for the study of gastric diseases according to modern scientific methods and led to the stomach-tube, not only as a new method of treatment but also of diagnosis.

A year later (1870) Jurgensen pointed out the disadvantage of the stomach-pump, as recommended by Kussmaul. The pump is difficult to cleanse, and in fact its use is superfluous. Jurgensen here introduces the principle of siphonage into the practice of gastric lavage, which entirely eliminates the use of the pump in this form of treatment. The soft-rubber tube is also here recommended, and Jurgensen fully explains the method of introduction of the stomach-tube, the position to be assumed by the patient, as well as of practicing the siphonage in freeing the stomach of its contents. This contribution must be classed as an advance in the therapeutics of gastric diseases. Jurgensen utilized the rubber tube terminating in a perforated ivory bulb. The bulb was guided by means of wire stylet. Four years later (1875) Ewald called attention to the fact that any rubber tubing having sufficient resistance could be introduced into the stomach without the use of a guide.

While Kussmaul drew attention to the therapeutic value of the stomach-tube, it remained for Leube at the Rostock Naturforscher Versammlung in 1871 to point to the value of the stomach-tube as a diagnostic measure.

Twelve years later (1883) Leube established his test meal as a means of determining that a normal stomach should be empty seven hours after the ingestion of a meal of water, soup, steak, and bread. It was not long after (1883) that Leube developed his well-known scale of the digestibility of various foods, which he earnestly advocated as a means of diet in the treatment of ulcer of the stomach. He divided the various foodstuffs, according to their digestibility, into four classes. This work is most valuable, pointing as it does to the importance of diet in gastric diseases, and marked an advancement in the therapeutics of diseases of the stomach.

From this time on the stomach-tube has been generally utilized not only for diagnostic but also for therapeutic purposes, and many modifications of this instrument have been devised. As with all other therapeutic measures, when employed without proper indications, the use of the tube has often been abused, and on this account has often fallen into disfavor, for lavage has frequently been practiced as a last resort, often after all other therapeutic measures have failed, and without proper indications. The therapeutic indications for lavage are definite. This procedure should be practiced for the removal of decomposing foods

and excessive secretions in cases of dilatation due to pyloric or duodenal obstruction, and in cases of fermentation, as is observed in chronic gastritis and in cancer; for the removal of mucus in chronic gastritis, and of excessive acid secretion. It is a most useful and life-saving procedure for the quick extraction of poisons which have been swallowed, as well as in removing the intestinal regurgitations occurring in obstructions of the bowels. In other conditions its use may at times prove beneficial; it then acts often only as a suggestive measure.

Among the modifications of the tube occasionally employed are the gastric douche, gastric spray, and powder-blower. The douche is used for treatment of the mucous membrane of the stomach. It consists of a tube with small-sized apertures, through which a fine stream flows stimulating the mucous membrane; the fluid employed may consist of Vichy water or a bitter tonic such as quassia, calumba, etc.

The spray of Einhorn is utilized for the instillation of small quantities of fluid into the stomach. The fluid introduced is usually a solution of nitrate of silver (.1-.2 per cent), which is employed in certain forms of chronic gastritis and in hypersecretion. Another apparatus of some importance introduced by Einhorn is the intragastric electrode used to apply electricity directly into the stomach.

Usually the intraventricular application of electricity is more beneficial than the extraventricular. The faradic current is especially useful in cases of gastric atony, and in some forms of gastric neuroses. The galvanic current is beneficial in painful gastric conditions, such as in gastralgias and pylorospasm.

DIET IN DISEASES OF THE STOMACH.

In diseases of the stomach the selection of a proper diet is often of more importance than the choice of drugs. No absolute dietetic regulations can be formulated in this class of diseases, but it is important to regulate the food in conformity with the particular disease with which the patient is affected, and also to consider the individual tastes and peculiarities of the patient. Even in the regulation of a diet in any special disease of the stomach, changes are often rendered necessary; these must be made gradually and according to the patient's powers to digest the food.

Food is said to be easily digestible when it produces no gastrointestinal discomfort, is passed from the stomach into the intestine at a normal rate of speed, and is easily absorbed. Under normal conditions the digestibility of foods is easily ascertained, for the functions of the stomach being normal, the effect of the food upon the functions can readily be determined; in the various gastric disturbances, however, this problem is more difficult. In determining the diet for a special gastric disturbance two points must be borne in mind: first, the power to increase the nutrition of the patient; and secondly, the necessity of giving food in a digestible form so as to lessen the work of the stomach. It must be borne in mind that the digestibility of food varies widely with the individual taste, for no matter how digestible a food may be, if it is unpalatable it will not be digested properly. In general it may be said, first, that in acute conditions the food should be of such a character that the stomach should be spared as much work as possible; second, in chronic disturbances it is important to supply sufficient quantities of nourishment in an easily digestible form, so as to maintain the body weight so far as possible. In determining the quantity of food that is necessary during twenty-four hours, the amount is estimated in calories of heat. As is well known, a human being at rest requires 35 calories per kilo of weight, whereas while he is performing light work he requires 40 calories. In order, therefore, to determine the exact amount of nourishment, it is only necessary to know the weight of the individual. Inasmuch as the proteins can be replaced in a measure by the carbohydrates and fats, an interchange of any of these three food elements can be made according to the patient's condition. When the weight of the person is known, it is an easy matter to determine whether the amount of nour-

ishment given is sufficient to maintain the body weight.

It is well also to weigh every patient suffering with a stomach disorder when treatment is first inaugurated, and to repeat this from time to time, in order to determine whether the patient is gaining or losing flesh.

The diet must be considered from the standpoint of the gastric secretion; there may exist, on the one hand, the condition of oversecretion of acid, and on the other, lessened secretion or absence of acid.

In cases of oversecretion an abundant protein diet is indicated, inasmuch as the excess of hydrochloric acid is neutralized by this class of foods. Ordinarily, the proteins that are best adapted for patients suffering from oversecretion of acid are the red meats and eggs, whereas the carbohydrates must be given in the most easily digested form.

In cases in which there is a diminution of the gastric secretion the protein foods are digested with difficulty, whereas the carbohydrates are more easily digested. In this condition, therefore, only very tender meats, preferably scraped, are to be given; whereas such easily digestible vegetables as spinach, mashed potatoes, and farinaceous foods may be eaten in quite large quantities. In both conditions of increased and diminished secretion of acid a reasonable amount of fat must be eaten, preferably in the form of good butter. The diet in muscular disturbances of the stomach depends greatly upon whether an excess or a deficiency of gastric juice is secreted; if there is an increase, an excess in protein food gives the best results; if, on the other hand, there is a diminution of this secretion, protein food must be given the patient in the most easily digestible form. The carbohydrates and the lighter vegetables may be given in somewhat larger proportion. In both conditions the ingestion of fluids should be reduced as far as possible. Normally, the appetite is a fair indication of the number of calories of heat that may be required; in conditions of gastric disorder, however, this is not the case; these patients lose their appetite, and consequently often take insufficient food. In those instances in which the gastric disorder is somewhat protracted and accompanied by great loss of weight, and in which the patient takes insufficient nourishment, it need only be remembered that such a patient resting quietly in bed requires quite a number less of calories than a patient who is not resting. This plan is therefore often taken advantage of in the treatment of many patients suffering from disorders of the stomach.

SPECIAL FACTORS BEARING ON THE DIET IN PATIENTS SUFFERING FROM GASTRIC DISTURBANCES.

1. Von Noorden demonstrated the fact that the intestine will vicariously perform the work of the stomach in conditions in which the secretion of the latter is lost. The point to be borne in mind is that even in cases in which the secretion of the stomach is lost entirely, the intestine may assume this function of the stomach.

2. In those cases in which it is necessary to spare the stomach, as when food cannot be digested or is vomited, either predigested foods may be utilized or foods may be administered through channels other than the stomach.

3. The following rules for eating should be carried out:

(*a*) Food should be thoroughly masticated; this is especially important in those cases in which there are marked gastric disturbances.

(*b*) The meals should be taken at regular intervals and in moderate quantities, according to the nature of the gastric disease.

(*c*) The temperature of the food is also an important factor in the treatment of gastric disturbances; as Uffelmann has pointed out, the food should be taken at a temperature between 98° and 100° F. The ingestion of very hot food is believed to be a frequent cause of ulcer and, as Mayo has recently pointed out, a factor in the production of cancer of the stomach. On the other hand, Wegele attributes the dyspepsia of many Americans to the taking of ice-cold water and other cold drinks.

(*d*) The question of rest or exercise after eating is one that is of considerable importance to those suffering from gastric disturbances. It is generally admitted that violent exercise should not be indulged in after eating.

From my own observations, it appears that in conditions of gastric disturbances accompanied by increased or decreased acidity, and in muscular disturbances of the stomach, the gastric digestion is improved during rest, but impaired by sleep after meals.

Among the special forms of treatment recommended in gastric disturbances may be mentioned the rest cure, first devised by Weir Mitchell. This treatment is especially useful in cases of nervous stomach disorders. It is also useful in the treatment of ulcer, gastritis, and other conditions. The rest treatment in gastric disorders should be carried out for a period of from six to eight weeks. The patient should be confined to bed a large part of this time and given a varied diet, food being supplied every two to three hours. Boas advises that instead of the large quantities of milk usually prescribed, the patient will do better if given ½ to 1 liter of cream daily in portions of 150 to 200 Cc. In addition to the protein food he advises a diet rich in carbohydrates and fats. Constipation may be overcome in most instances by the addition of such foods as honey, preserves, buttermilk, kumiss, and kefir. The results that follow this plan of treatment are often marvelous. In referring to the question of diet, I cannot pass by this subject without touching upon the question of the use of Bulgarian buttermilk, of recent introduction in America, but long used in the Orient. The importance of this form of milk, and its high nutritive value, was first recognized by the Bulgarian physician, Grigoroff, and more recently by the French physicians. It contains three forms of bacteria, the most important one being the bulgaricus, causing the acidulation of the milk. The organism produces a fermentation of the sugars and causes the coagulation of the milk, forming lactic acid. The Bulgarian buttermilk is exceedingly digestible, due to the fact that its casein and albumin are rendered soluble. Metchnikoff ascribes a life-prolonging effect to this milk, due to the fact that in Bulgaria, where this form of milk is employed as a regular article of diet, there are many individuals above 100 years of age.

There can be no question but that the decomposition effect in the intestine is favorably affected by the Bulgarian milk. Tablets containing the Bulgarian bacilli are detailed by various pharmaceutical establishments and have been highly recommended. Another food employed in recent years to a very large extent in the treatment of gastric disorders is olive oil. This substance has been most satisfactorily used in the treatment of ulcer and other gastric disorders, and is of great value both as a food and as a remedy.

In this connection I must call your attention to an oil recommended in the last few years by Lane—paraffin oil, a mineral oil, which is now very largely employed with most beneficial results in the treatment of intestinal stasis. This oil is not a food, however, as it passes unchanged through the intestinal tract.

Certain advances have been made in the medical treatment of ulcer of the stomach in the past few years. According to the older plan, the Leube treatment was almost constantly followed. This consists of placing the patient at complete rest in bed for fourteen days or more, upon liquid diet mainly of milk. Upon such a diet the patient frequently loses much flesh as well as strength.

On this account Lenhartz cautions against the strict abstinence diet in the treatment of ulcer of the stomach, even in those instances in which there is hemorrhage. He bases his conclusions on the fact that since ulcer of the stomach is most frequently accompanied by superacidity and also by an enfeebled condition, it is best to give protein food early to overcome the acidity as well as to build up the system.

In the Lenhartz cure, absolute rest in bed for at least four weeks is maintained. An ice-bag is placed on the abdomen, and left on more or less continually for two weeks. On the first day, even though there be

hematemesis, 200 Cc. of iced milk are given in teaspoonful doses together with two raw, ice-cold, beaten-up eggs.

The eggs are beaten up with sugar, and they are kept cold by placing the cup containing them in a dish filled with ice. The milk is increased every day 100 grammes, and one additional egg added; on the ninth day the patient is given 1 liter of milk, and the quantity is not increased; on the sixth day raw scraped beef is added, and the quantity is doubled on the following day; on the seventh and eighth days the patient is given some well-cooked rice and zwieback (softened); and on the tenth day raw ham and butter.

Only recently Sippy has evolved a method of treating peptic ulcer which seems likely to replace all other methods of treatment. The treatment consists in protecting the ulcer from the acid corrosion until it has healed, by shielding it from the corrosive effect of the gastric secretion.

He accomplishes this by maintaining a neutralization of all free HCl from early in the morning until late at night. This is effected by frequent feedings and the use of alkalies given frequently. The patient remains in bed for three to four weeks. Three ounces of a mixture of equal parts of milk and cream are given every hour from 7 A.M. to 7 P.M. After two or three days soft eggs and well-cooked cereals are gradually added until in ten days the patient receives 3 ounces of milk and cream mixture every hour, three soft-boiled eggs and 9 ounces of a cereal each day. Cream soups of various kinds, vegetable purées, and other soft foods may be substituted now and then as desired. Powders of magnesia and soda and bismuth and soda are given between the feedings to neutralize the acid secretion. The details of the treatment can be found in a recent number of the *Journal of the American Medical Association.*

I have been employing this method in the treatment of a large number of cases of peptic ulcer with most gratifying results.

Of the greatest importance in the treatment of certain cases of ulcer is the method devised by Einhorn, known as duodenal alimentation. By means of this method food can be introduced directly into the duodenum. The instrument employed consists of a small capsule perforated and attached to a long rubber tube, at the other end of which a syringe can be applied. The tube is swallowed while drinking water, and the instrument soon passes into the stomach, and within an hour or two into the duodenum. Care should be taken to see that it is in place before the feeding is started. This may be done by gentle traction, which shows a slight resistance if the tube is in the duodenum; by aspiration, which will often bring up golden-yellow duodenal juice without any gastric secretion; or, perhaps best, by giving the patient some liquid to drink by mouth and immediately performing aspiration. If the end of the tube is in the stomach, the fluid can be removed. Any liquid food may be employed, but mixtures of milk-sugar and raw eggs are the most useful. Care should be taken to see that there are no particles in the food that might clog the tube. The amount at the beginning should be small, 100 Cc. every two hours, beginning early in the morning and stopping late in the evening. This quantity may be gradually increased up to 300 Cc. If eight feedings are given in twenty-four hours and each feeding consists of 280 Cc. of milk, one egg, and one tablespoonful of sugar of milk, the patient will receive approximately 2280 calories, which is ample for an average individual, and if the patient is at rest in bed it is sufficient to allow a gain in weight.

Einhorn has perfected a special syringe, with which it is possible to administer the food without disconnecting the tube. Morgan has suggested a method like that of Murphy for giving salt solution per rectum, permitting the fluid to flow from an irrigating jar, and so arranging the pet-cock that the food is taken slowly, the 300 Cc. of nourishment taking about twenty-five minutes. The food should be administered at body temperature and the heating should be done slowly, for if it becomes too hot it is liable to become thick and lumpy. After heating, it is well to strain the food to be certain to have it free from small particles. If the food is used too warm or too cold it

is apt to cause uncomfortable symptoms, sometimes causing the patient considerable shock; a too rapid administration causes flatulence. After each feeding a syringeful of water at 98° F. should be injected, then the pet-cock closed and the syringe filled with air, which should be injected after the pet-cock has been opened; the pet-cock should then be closed and the syringe disconnected. This procedure is very important, and serves to keep the tube clean and empty.

Of the many remedies employed in the treatment of the various gastric disorders there is one of unusual importance, as it appears to have an almost specific effect in certain conditions. The drug is atropine, which by depressing the vagus fibers decreases the secretory and motor functions of the stomach. Through the researches of Eppinger and Hess, the theory has been advanced that disturbances of the autonomic nervous system (which includes all of the efferent nerve fibers outside of the cerebrospinal axis excepting those supplying the voluntary muscles) lead to increased and decreased tonus or excitability, and that through this system the activity of the glands of internal secretion are regulated and controlled. According to this theory, therefore, a gastric ulcer may have as its underlying basis an increased vago-tonus, and atropine by depressing this vagus excitability decreases the possibility of gastric irritation. Clinically it has frequently been noted that healing has been effected in obstinate cases of gastric ulcers when patients were systematically treated with atropine or belladonna.

A word might be said concerning the administration of hydrochloric acid, which has been always regarded as an efficient remedy in the treatment of certain forms of gastritis. It is a well-known fact that when taken internally hydrochloric acid has the power to stimulate the secretion of the gastric ferments. This is occasioned by the action of the acid on the pylorus, producing a secretin which when absorbed again stimulates the gastric secretion. It is also well known that when hydrochloric acid is administered it directly stimulates the gastric secretion of hydrochloric acid of the diseased gastric mucous membrane, and also awakens in the gastric mucous membrane the power to produce further acid on the ingestion of food. Hydrochloric acid is best administered after food by giving small doses at 10, 15, 20, and 30 minutes later, thus in a way imitating the natural process of digestion. The proper digestion of food cannot be obtained from hydrochloric acid alone; pepsin must be present at the same time.

Up to a comparatively recent period it was generally held that the administration of pepsin was needless, for it was assumed that the minute quantities needed for proteolysis were present in the stomach. However, it is now known that in order to procure good gastric digestion it is necessary to have both the hydrochloric acid and pepsin thoroughly mixed. This is not thoroughly accomplished when hydrochloric acid is given alone, and pepsin should be administered at the same time; it is also quite useless to prescribe pepsin alone. Hydrochloric acid aids the intestinal digestion, inasmuch as proteids which have been acted on by hydrochloric acid and pepsin are much more easily digested by trypsin; in addition this acid acts upon some precursor in the duodenum producing an intestinal secretin which being absorbed stimulates the flow of the pancreatic secretion.

MECHANICAL SUPPORTS.

I must call attention briefly to the mechanical therapeutics, consisting mainly of the abdominal support in the treatment of enteroptosis. This apparatus is employed in supplying a support to the relaxed abdominal wall and in holding the organs as far as possible in position. The beneficial effect of this apparatus is effected by relieving the symptoms arising from the pressure of the abdominal organs. The supports consist of bandages and corsets. The number of apparatus of this character is almost innumerable, almost every specialist having a bandage or corset furnished to conform with his own views. It is not always a simple matter, however, to supply a well-fitting bandage or corset. In a stout

individual with a pendulous abdomen this is not usually a difficult matter, but in thin individuals there is often great difficulty in adjusting a support which actually holds the organs in proper position.

The need of a support is quickly indicated by means of the Glénard's belt sign. One stands back of the patient, passing one's arms on either side with both hands on the lower abdominal walls. The abdominal flesh can easily be elevated; by suddenly dropping the hands the abdominal mass may be allowed to fall. If the symptoms have been relieved by the support of the hands and return by their removal, there is every indication for the need of an abdominal support or corset.

MINERAL-WATER CURES.

Mineral-water cures have been utilized for many years in the treatment of certain gastric disorders, and yet notwithstanding the fact that these cures are among our oldest methods of treatment, we know but little regarding their actual physiological effect. Our knowledge concerning their action is wholly empirical, and their use must therefore be entirely based on purely clinical evidence. It is well known that the effect of the water is far better when taken at the springs. This may be partly due to the fact that the beneficial effect is augmented by the healthy surroundings, freedom from care, the rest and diet. The fact that many of these waters, as has been recently discovered, are radioactive may also account in a measure for their beneficial effect, and inasmuch as this radioactivity is largely lost in transportation, for their failure in giving relief when taken away from the springs.

INDICATIONS FOR SURGICAL INTERVENTION.

One cannot pass by the question of the treatment of gastric disorders without at least alluding to a few facts regarding the surgical aspect of these conditions.

The newer surgery of the stomach was introduced with Billroth's successful pyloric resection for cancer, and Wölfler's gastroenterostomy in 1881. Since that time there has been a steady advancement in the results of surgery, many so brilliant that operation has often been undertaken as a cure for all forms of indigestion; the results of which have often been dismal failures, increasing rather than relieving the patient's discomfort. At the same time indiscriminate surgery has had a distinctly harmful effect in the advancement of surgery of the stomach. However, when the indications for surgical intervention are present, the results of surgery are most brilliant and gratifying.

The indications for operation on the stomach are as follows:

1. Obstructions, whether at the cardiac or pyloric orifices. Gastrostomy is indicated in impermeable strictures of the cardiac orifice or of the esophagus, and gives great relief until the stricture can be dilated; it prolongs life in cases of carcinoma of this region. Operation is always indicated in obstruction of the pylorus, whether the obstruction be due to simple pyloric stenosis or due to cancer. In cases of benign obstruction, the operations indicated are pyloroplasty, gastroenterostomy, or pylorectomy; in malignant disease pylorectomy is indicated for cure and gastroenterostomy for relief.

2. Gastric ulcer. Simple uncomplicated gastric or duodenal ulcers do not require operation. Operation must only be considered when there are complications or when the ulcer has resisted a thorough medical cure.

The indications for operation are perforation, pyloric obstruction, and ulcers defying thorough medical cures. The surgical procedures which may be undertaken are excision of the ulcer, pylorectomy, pyloroplasty, or gastroenterostomy. The exact procedure to be followed must be determined by the surgeon at the time of the operation.

3. Gastric carcinoma. There is but one cure for cancer of the stomach, and that is operation. This can be accomplished only however when the diagnosis is made early. Inasmuch as early diagnosis is usually most difficult and often impossible, it is wise to urge upon all individuals over forty years of age who manifest symptoms of indiges-

tion which are not relieved by a few weeks of treatment the need of a most critical examination, and if the diagnosis still remains doubtful, of exploratory incision. It is by this method alone that cases of carcinoma of the stomach can be determined early, and at that stage when cure is still possible; otherwise the operation can only be in the nature of relief—gastroenterostomy for relief of obstruction—but not of cure.

I have outlined as far as it is possible in this brief period of time the modern method of treatment of the diseases of the stomach, and I must again emphasize what I attempted to point out at the beginning of this paper, namely, that the treatment is exceedingly simple if the diagnosis be correctly made. It behooves us therefore to study our cases most carefully and critically, so that we may become confident, as far as it is possible, of the correctness of our diagnosis; the treatment follows the diagnosis directly, and can therefore easily be outlined. It is only in this manner that we can secure the very best results.

THE INDICATIONS FOR OPERATION IN GLAUCOMA.

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Secondary glaucoma will not be considered in this paper. Indications which follow apply to primary glaucoma only.

Operation should be performed:

1. In all cases of acute and subacute glaucoma and in all chronic cases on the manifestation of any inflammatory glaucomatous symptoms.

2. In all cases of chronic glaucoma in which there is doubt of the patient's cooperation in the persistence in the myotic treatment throughout the remainder of life. This includes practically all hospital cases and such private cases as may be of a weak and vacillating disposition.

3. In all cases of chronic glaucoma which reside at such a distance from proper ophthalmic care that they are unable to report at sufficiently frequent intervals for the supervision necessary in the proper and safe carrying out of the myotic treatment, or for operation in the event that inflammatory symptoms arise.

4. In chronic cases under fifty-five years of age, when the field of vision and central vision are good, an operation upon the most affected eye is advised, myotics being employed in both the operated and unoperated eye for the remainder of life. Operation upon the second eye should follow, if subsequent observation shows that vision is maintained better in the operated than in the non-operated eye.

5. In all cases of chronic glaucoma, without regard to age or the development of the disease, in which myotics have been given a faithful trial for at least six weeks or two months, as evidenced by the constant maintenance of pupilary contraction to almost pin-point size, and in which vision and the field of vision show progressive deterioration.

Cyclo-dialysis is preferred in all cases in which operation is demanded if there be a hemorrhagic tendency or the field of vision is very much reduced. Iridectomy is reserved for all other cases. The trephining operation has been relinquished, as it appears to be a more dangerous procedure than iridectomy, on account of the opacification of the lens which follows in not a few cases, either immediately or remotely after the operation. Furthermore, even in cases in which these complications do not arise, it has not been proven that the visual results after trephining are any better than those obtained by a properly executed iridectomy.

In all cases not included under the five headings given above, myotics should be employed with great zealousness and persistence four times during the day. The maintenance of vision by this method does not warrant the gloomy prognosis which is so often rendered in cases of chronic glaucoma.

SOME PHYSICAL FACTS ABOUT THE RADIOACTIVE ELEMENTS AS APPLIED IN MEDICINE.[1]

BY WILLIAM S. NEWCOMET, M.D.,
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It is the desire in this paper to bring before this body a few of the more common misconceptions that seem to exist regarding these radioactive elements.

There is a general impression throughout the medical profession that radium and the allied elements are bound up in a mystery, that the natural laws governing them are past their comprehension, and that they must be used in a mysterious way to obtain results. Let it be understood that the sooner this mystery is set aside, the better it will be for the medical profession; and, perhaps, those who are exploiting radium by the assurance that they possess the only obtainable supply will be the sufferers.

It is, however, most unfortunate that the supply of radium is so scattered, and some institution could accomplish a bold stroke for mankind if it could centralize or develop an institution where radium and its allied elements could be obtained and employed strictly for what they are worth, divorced entirely from all tendency to exploitation. The expense of maintaining a proper plant would be enormous in proportion to the amount of work accomplished, but so long as radium remains in the hands of private institutions, or worse still, in private hands, just so long will its usefulness be impaired.

The use of these elements medically must be divided into two divisions: (1) For the purpose of radiation; and (2) for employment as medicine internally, depending upon either the radiation or, perhaps, as with other drugs, to some extent the base itself.

First let us consider its local use, where it controls or is supposed to control certain pathologic processes by the radiation of certain rays, the principal one being the most penetrating of all rays, the γ-ray, analogous to Roentgen rays. A second ray known as the β-ray is a ray analogous to the cathode ray, but here again it has a greater power of penetration, and it no doubt plays an active part where these radioactive elements are employed. A third ray, the Alpha-ray, is practically worthless in external applications, although 90 per cent of the energy of these radioactive elements is of this form.

Where these elements are to be used for their radiation the usual form of application is a small flat disk for surface radiation, or small tubes where deeper radiation is desired. The applications are to a certain extent merely a makeshift and are adopted according to the part to be radiated. While fulfilling a purpose, they do not meet the issue to the same extent as in cases in which the separate radium elements are employed and the application molded according to the necessities of the individual case; for instance, if it is desired to insert a given amount of radium into a tumor the strength of 200 or 300 mgs. may be placed in a glass tube which can be slipped into the eye of an ordinary surgical needle of fair size; and, furthermore, if it is lost, the whole neighborhood need not be alarmed. Again, if it is desired to cover a flat surface, a certain dosage, a given size, all that is required is to charge a small piece of metal with the active product, which is left in place for a certain length of time, and the patient can keep it as a souvenir of the occasion. Not until we have some such method established in our midst will it be possible to obtain results that justify confidence.

It must be remembered that radium is merely the parent, that it simply gives forth the elements which give rise to the "active deposit," and while all the therapeutic activity depends upon them, their life is short, and therefore they soon become worthless. In the meantime these elements have again recovered and are ready for further manipulation.

The thorium elements, unfortunately, undergo disintegration in a rather irregular

[1]Read before the College of Physicians of Philadelphia, Nov. 3, 1915.

fashion and, therefore, do not permit the manipulation which is so convenient in this radium group; and while the rays of thorium are still more penetrating than those of radium, its use must be confined to the applicator method; furthermore, its manipulation from a chemical standpoint is difficult.

To thoroughly comprehend the various manipulations possible with either the radium series of elements or those of thorium, it would be necessary to consult and compare the table of these elements showing their average life and the rays emitted by each one; necessarily, rather complicated apparatus is required for their manipulation, and while it is not the province of a physician to carry out the difficult proceedings in the preparation of these different products, we should have established in our midst reliable laboratories where these preparations could be obtained and measurements made as the occasion demanded.

The following instance illustrates, for the sake of protection, the need of such institutions. A few months ago a dealer in this city had two tubes of radium for sale. The reason given seemed sufficient. He stated that they had originally been purchased from a well-known chemical house, the price being $400 to $1400. Tests were made, and it was found that the amount was frightfully small compared with the price asked. He was therefore advised to send them to Washington for collaboration, for if he sold them legal possibilities might develop. A few weeks later the tubes were promptly returned to their owner, and the dealer, who had always been careful of his reputation, was profuse with his thanks for the advice. The value of the radium in the tubes was 40 cents and $30 respectively. Is it any wonder that a plea is made that those using these radioactive products should familiarize themselves to some extent with the physics or leave it alone? Imagine a patient being treated with 40 cents worth of radium! Is this not sufficient reason that a central station should be established to prevent such exploits? Many of you are familiar with several such occurrences in the past, but that these tactics still prevail is past comprehension.

While the external use of radium seems to have many pitfalls the internal employment has many more. Of this, the following is an example. About a year ago a certain physician stated in this building that he possessed a tube of radium which in the daytime he used for the treatment locally, and which at night he placed in a jar of water. He then gave this water to his patients, and from it he claimed to have obtained some brilliant results. Furthermore, he stated that he had measured the activity of the water.

There seems to be a confusion between the so-called rays that emanate from the different radium elements and the emanation, which is an element and a gas—subject to all the laws of all other gases, and consequently when confined within a tube cannot escape. Therefore, the water did not contain emanations. The question still remains: from what did these patients derive their wonderful therapeutic effects?

In the internal administration of radium or thorium certain facts must be taken into consideration, inasmuch as it is the radioactivity and not the elementary base that affects the system, for the quantity is too inconceivably small to be considered from that point of view. Therefore, it would appear that the alpha radiation of these elements might be responsible for any physiologic or therapeutic activity. This being so, in what forms is it possible to bring it into the system; then, in turn, how does it leave the system? Like all other therapeutic agents of this class, this is by far the most important question.

Here again we come to a point needing the most careful study: for example, radium may be given as a salt, which may be either soluble or insoluble; or its product of disintegration may enter the system as a gas in the form of the emanation. These salts give off the emanation in proportion to their age, and continue to give in a definite ratio indefinitely, or as long as they are contained within the system. It must be remembered, however, that insoluble salts allow only

about 2 per cent of the emanation to escape, the rest being occluded within the walls of the powder unable to escape. If a salt of radium is administered, its elimination is by the natural channels, while the emanation formed by it during the time it is in the system is mostly eliminated by the lungs. On the other hand, during the time the radium salt remains within the body the "active deposit" is thrown down, and it being a solid is eliminated as other solids.

Therefore, upon comparing the two methods of administration we have radium, emanation, and active product; while with the second we have emanation and "active deposit." Radium may be obtained in solution; the strength is easily calculated, and the dosage estimated accordingly. Its strength, after it has obtained its equilibrium, is more or less constant. It does not degenerate, at least, for a few hundred years. Being in solution it is absorbed and carried by the blood stream throughout the body. Just what effect the sulphates of the body have upon it is not definitely known. Some claim that it is eliminated promptly; others that it extends over days and weeks; and so on. While in the body it is giving forth its activity, changing slowly into the emanation, the emanation in turn to the "active deposit." Now, should an insoluble salt be administered it passes along the alimentary canal unabsorbed, but it gives off the emanation and "active deposit" which are absorbed. It still holds, however, that the major portion of this emanation remains occluded within the intermolecular spaces of this insoluble powder. Its effects continue until it is eliminated.

But how about the emanation? Here the question is quite different. Although given in solution, water containing emanation must be used at the source with as little agitation as possible; for, like all gases, its solution depends upon all the other natural laws plus those of the rapid disintegration. When it cannot be obtained directly from a spring, the ordinary commercial emanator should be used under the best conditions. It is not a very efficient piece of apparatus, and some of the types placed upon the market are ridiculous. To have a very efficient activator would require one with some skill in its manipulation. Unfortunately, the efficiency depends again upon employing the soluble salts. In the soluble radium salts under the best management about 20 per cent of the emanation will be lost. When you consider that the insoluble salts are usually employed, and that only a 2-per-cent efficiency can be obtained at best, plus the 20-per-cent decrease, it would seem that very little is obtained for the outlay. But the point is, that when the emanation is to be employed, this offers the only practical means of obtaining it.

The emanation taken into the stomach is rapidly absorbed, passes through the system, and in a very short space of time is eliminated by the lungs. Needless to state that its action is transient, and that repeated doses are needed. Sipping moderate quantities of water charged with the gas seems to be the adopted method.

It has been used in baths and inhalations. These methods perhaps might prove useful in the hands of very careful operators, but for general use their efficiency is doubtful. Here attention might be called to the existing conditions in the use of the thorium salts, for if these elements ever become of therapeutic value, these facts will prove most useful. The average life of radium emanation is about 5½ days, while that of thorium emanation is 76 seconds. Now suppose we should take a certain amount of radium emanation into our system. During the time which it remains a certain amount of "active deposit" is formed, but the chances are that most of it will be eliminated as emanation. On the other hand, if thorium emanation is taken into the system, the greater portion passes over into "active deposit," while little of it escapes, the cycle of time being too short. Needless to state that the same principle is employed in the thorium emanators, they in turn being less efficient than the radium emanator, due to the rapid disintegration of these thorium elements.

The desirable product for the internal administration of thorium is thorium X. It has about the same period of life as radium emanation. Therefore, when it is employed

the patient must be close to the source of supply. Since it is a salt instead of a gas, it remains within the system undergoing a very rapid change to emanation and "active deposit," and for this reason the thorium product is more powerful than the analogous radium product.

In these products we have extremely powerful agents which cause profound systemic disturbance. Their value as therapeutic agents has by no means been established. Yet they are being employed throughout the country for the relief of these distressed individuals by persons who have little comprehension of the consequences. There is not the least doubt that they are of value, but like all other materials used in our medical arts, the results are in proportion to the skill employed in their use.

The object of this paper is to draw attention to a few facts frequently confused; and while it is realized that there are many more points to be covered, the few to which allusion has been made emphasize the magnitude of the subject. Fortunately, where these articles have been used, the dosage no doubt has been small, and the baneful effects, if any, have been inconsequential. Likewise, the good that might have been expected failed, for the same reason.

PREVENTION OF TYPHOID FEVER BY VACCINATION.

BY SIDNEY J. MEYERS, M.D., LOUISVILLE, KENTUCKY.

The importance of prophylactic measures in typhoid fever, which for many years has been called "the American disgrace," is emphasized by the fact that annually about twenty-five thousand people in the United States perish from this cause alone. The disease is said to have been more prevalent and fatal in this country than in any other civilized land, which seems a strange commentary upon the presumed prophylactic, sanitary, and hygienic enlightenment of which we have boasted during the last fifty years!

While typhoid fever has probably prevailed more or less extensively from remotest antiquity, not until the etiology was placed upon a definite basis by Eberth's discovery of the causative bacillus (1880) was it understood that the malady might be legitimately classified among the unnecessary and distinctly preventable diseases. Since then some of the most eminent observers in the world have endeavored to devise adequate prophylactic measures which would be generally applicable.

Recognizing that the principal source of the infectious material was water polluted by the dejecta of those suffering from the disease, the earlier prophylactic efforts were for the most part directed (*a*) toward disinfection of all the discharges, followed by purification of the sources of water-supply, (*b*) improvement in hygienic and sanitary surroundings, and (*c*) the sterilization of milk, which it was thought might have become contaminated by the admixture of water. Later investigations, however, demonstrated many other avenues through which infection might be derived—*e.g.*, oysters, clams, fish, and uncooked vegetables were each found responsible for dissemination of the disease at various times.

While the original proposition still remains unchanged—*i.e.*, that in the majority of instances typhoid fever is disseminated through the media of contaminated water and milk—it has been demonstrated that the common fly is also a most prolific purveyor of the infection. It is not difficult to understand how flies may transport infectious material from one place to another, and this applies to other diseases as well as typhoid fever. All foodstuffs exposed to dust and flies may become contaminated, and thus constitute a distinct menace to human life. With the recognition of these multitudinous avenues of possible infection, the inadequacy of former prophylactic methods became apparent and more effective means were diligently sought.

For the first observations upon the prophylactic and therapeutic inoculations in

typhoid fever the profession is indebted to Frankel (1893). Three years later Pfeiffer, Kolle, and Wright advocated antityphoid vaccination or inoculation with living or dead bacilli; and since then extensive experimental and clinical investigations have been prosecuted by competent observers in practically every civilized country.

Antityphoid vaccination was practiced in both civil and military quarters of certain other nations several years prior to 1911, when it was made obligatory in the army of the United States. It is shown by statistics that in the British army in India during a period of five years the typhoid rate was reduced by vaccination from more than fifteen to less than five per thousand; among the French soldiers during an epidemic of typhoid fever, not one who had been vaccinated contracted the disease; in Morocco there was no case of infection among those similarly protected; in the Italian and Japanese armies favorable results were also obtained. In the armies of Japan and France antityphoid vaccination has been made obligatory.

In the Spanish-American war, before vaccination was made compulsory, the death-rate from typhoid fever was enormous. In 1911 there were only two cases in the United States army, with no deaths; in 1913, among ninety thousand American soldiers there were three cases and no deaths. It is reported that in these three infection occurred prior to enlistment, and the disease developed before vaccination could be practiced. Therefore, one may reasonably claim that typhoid fever has been abolished in the United States army by prophylactic vaccination.

"The conclusion is inevitable that the prophylactic vaccine used in the army has given almost absolute protection against typhoid fever, without producing untoward effects of any character, showing definitely that the vaccination is both efficient and harmless" (Russell). Harris adds "that vaccination gives immunity to great masses of those exposed is most eloquently attested to by the vigorous and severe test it has received in our army and navy among more than two hundred thousand men."

In many of the large hospitals and other institutions of this country and abroad antityphoid vaccination has been made compulsory for all employees, including physicians, internes, nurses, etc., with the result that both the morbidity and mortality from the disease have been markedly minimized. In other similar institutions such vaccination remains optional. The results thus far secured have been so favorable in some of the foreign countries that it has been suggested antityphoid vaccination be made compulsory in all schools the same as vaccination against smallpox. While based upon the results obtained among soldiers and in institutions this would seem a most admirable plan, it is extremely doubtful if it could ever be made generally operative for obvious reasons. It should be remembered, however, that children apparently contract typhoid fever with greater ease than adults, one-third of all deaths from this cause occurring in those under twenty years of age. "Young adults and the youthful are most likely to contract this disease, although it may occur at any age. This is the age, then, for the greatest effort to be made to give protective inoculations." It is further suggested that "all nurses and members of hospital staffs; students of colleges and seminaries; employees, and those who are interned in workhouses, jails, prisons, and asylums; men in lumber camps; and all those who travel and are therefore subjected to varying water, milk, and food supplies, such as 'traveling' men, engineers, seamen, tourists, and vacationists, should receive typhoid preventive vaccination" (*Journal of the A. M. A.*, Oct. 31, 1914).

Typhoid fever is always more or less prevalent in Kentucky, although definite epidemics are now less frequently observed than formerly. During the last year or two considerable reduction in incidence of the disease has resulted from prophylactic vaccination. For instance, prior to July, 1914, about seven thousand antityphoid inoculations had been made under the direction of the State Board of Health, and not a single case developed among those so treated, although many of them were immunized during epidemics. "In the present state of

rural sanitation in Kentucky, the State Board of Health feels that antityphoid inoculation should be especially recommended in every individual between the ages of fifteen and thirty years at intervals of two years." Thousands of immunizing doses of antityphoid vaccine have been distributed in Kentucky, and other States where typhoid has prevailed in the past have been equally aggressive in the campaign of prevention.

It is stated by Bass that since the almost absolute protective value of antityphoid vaccination has been proved, the fact should be promptly accepted by the medical profession, who should encourage its public acceptance by example, but especially by expressions of absolute confidence. "A doctor should no more question the value of antityphoid vaccination than he should question the vaccination against smallpox, or mosquito transmission of yellow fever or malaria" (Bass).

Shimer agrees that vaccination is as successful in preventing typhoid fever as smallpox, and says there are no valid reasons why everybody outside the army and navy should not also be vaccinated; but as vaccination against typhoid fever does not prevent other water and milk-borne diseases, sanitary improvements are as necessary after as before vaccination.

There are no attending dangers if vaccination be properly executed, and the prospect of immunity for at least three years which the method affords would seem to amply justify the procedure. It has been recommended that practically the same plan be followed as in vaccination against smallpox. Four series of immunizing doses of vaccine are given, the first in infancy, the second in childhood, the third in youth, and the fourth in adult life.

Antityphoid vaccine is administered hypodermically under strict aseptic precautions. The site of inoculation, usually at the insertion of the deltoid muscle, should be sterilized by application of tincture of iodine; the vaccine is then injected with a sterile syringe. The inoculation is made in three doses, the first consisting of 500 million dead bacilli; the second of 1000 million bacilli is given after an interval of from a week to ten days; the third of 1000 million after a similar interval. Following each injection the region is painted with collodion and allowed to dry. The vaccine should be merely introduced subcutaneously, not deeply into the muscular tissues. The local and systemic reactions are usually slight if proper technique has been used. The temperature is seldom above 100° F., and subsides to normal within twelve to sixteen hours. The local reaction is greatest following the first injection, less after the second and third. There may be noted slight pain and a moderately inflamed area at the site of puncture, with tenderness of the axillary glands. These manifestations disappear within twenty-four hours.

Quite recently Harris, of New York, has published an extensive review of this entire subject and presents the following conclusions, with which it is believed every experienced observer will heartily and entirely agree:

1. The accurate observations recorded in hundreds of thousands of cases leave no doubt as to the preventive powers of antityphoid vaccination in all but a relatively insignificant few.

2. In those subsequently affected it strikingly decreases the morbidity and the mortality.

3. Severe reactions, if one makes observations from extensive studies (the only correct way), are rare.

4. To avoid severe reactions one must observe carefully several precautions, as follows:

(*a*) Never administer it to any but the healthy.

(*b*) To permit of slow absorption, avoid puncture of a vein, or intramuscular injection.

(*c*) Clean syringe and sterilize the area for injection, using tincture of iodine for the latter purpose.

(*d*) Children especially are to avoid exposure to the sun following treatment.

(*e*) Avoid administering it during the menses or pregnancy.

(*f*) Allow no hard work or indulgence in alcohol after the injection.

(*g*) Avoid reinjecting in indurated areas.

5. Severe reactions have never left permanent injury.

6. When the incubation period has begun, the time for antityphoid immunization has passed. The treatment is a preventive of typhoid fever, and not a typhoid antitoxin.

7. Long exposure to overwhelming doses of typhoid bacilli (in those who are in close contact with cases and especially in epidemics) may nullify the immunizing powers of antityphoid vaccine, and an attack may therefore follow one or more injections.

8. Chronic illness (tuberculosis, etc.), as well as debility from other causes, and fatigue and exhaustion as well, predispose to severe reactions.

9. Injections after intimate and long exposure hasten the onset.

10. For a period of at least two years, and possibly more, immunization is as effective in protecting from an attack of typhoid fever as is a previous attack of the disease itself.

11. Recurrences may follow after a complete immunizing course of treatment, in exceptional instances in which debility and fatigue exhaust the resistant and defensive powers of the body, and when exposure to massive doses of typhoid bacilli exists.

Russell has suggested that all persons whose profession or duty involves contact with the sick should be immunized. "The general vaccination of an entire community is feasible and could be done without interfering with general sanitary improvements, and should be urged wherever the typhoid rate is high" (Russell).

THE TREATMENT OF ACUTE OTITIS MEDIA.

In the *Virginia Medical Semi-Monthly* of September 24, 1915, WILKINSON states that in the first stage he gives his patients something for relief of pain. He gives hot drops of glycerin, atropine, and a sedative containing either tincture of opium or morphine. These should be instilled into the ear hot. If they are not hot, very little will be accomplished by their use.

Local applications of heat of some kind are always graciously received and are to be commended. A hot salt solution or hot-water bag or a hot iron are convenient means of applying local heat, and they often bring relief. Wilkinson wants to warn against a pernicious habit which is too commonly practiced—that is, of leaving the ear exposed after it has been subjected to some form of heat. He invariably ties up an ear after it has been aching, and keeps it tied up during the following night. He is certain that many ears are permitted to go on to suppuration from the neglect of this simple precaution. He has heated an ear and caused a local perspiration, and then exposed it to the atmosphere, and the ear aches again. In other words, we rest on our arms and permit the enemy to reload and come at us again.

Since a patient with acute otitis is usually suffering with a cold, means should at once be instituted for its relief. A calomel purge is indicated, followed with a saline or the good old remedy, castor oil, and, aside from a personal dislike to the taste, Wilkinson feels that it has, especially in children, a somewhat specific action in congestions of the nose and nasopharynx. He puts his cases to bed with instructions for them to stay there till next day. The surest way of preventing the otitis from going on to suppuration is to keep the patient on light diet, with a liberal supply of water, and in bed for at least twenty-four hours.

In all cases, except very small children, sedatives are indicated where the pain is severe enough to justify them. Of these, Wilkinson usually prefers aspirin and small doses of phenacetine with a little caffeine to prevent depression. They add to the comfort of the patient as well as tend to abate the attack. [Some believe aspirin is contraindicated.—ED.] The other treatment in these cases in no wise differs from that of the treatment in the second and third classifications which he will mention later. In some cases an opiate may become necessary, but as a rule it is contraindicated, as it masks the symptoms; besides, any case which is not relieved with the above reme-

dies has advanced to suppuration and the drum should be incised.

Treatment of the suppurative or exudative stage will depend entirely on the condition found. If the drum is not yet bulging and the pain not severe, he is inclined to follow out the treatment as given for the incipient cases above—*i.e.*, hot drops, hot local applications, depletion with mercury, and put to bed with ear tied up and wait twenty-four hours. Wilkinson is not one of those who believe that every red drum should be incised. He admits that in some cases the drum will break within twenty-four hours after the onset, but this is the exception. The pain and temperature will naturally aid in determining the severity of the case. If there is a bulging drum, there is no use in waiting. Make a rather liberal incision through the posterior portion of the drum; do not merely do a paracentesis, but make a large opening. A paracentesis is often worse than nothing, and the word ought not to be known in aural surgery.

If the drum is cautiously painted once or twice with equal parts of menthol, carbolic acid, and cocaine, it can be incised with but very little pain. Wilkinson thinks the electric light in the speculum enables the unaccustomed practitioner to see better than the average head light. A middle-ear cavity that is filled with secretions is sufficiently deep to permit of incising the drum without incising the mucous membrane of the inner wall of the cavity, which is exceedingly sensitive and is not anesthetized by local application on the drum membrane. He is sure this is often the cause of much pain in opening the drum. In small children and some nervous subjects a general anesthetic is often necessary, nitrous oxide gas being the one he usually uses. Some surgeons claim that to incise the mucous membrane is of benefit, but he fails to see its virtue, since drainage is the chief object in view. After the drum is incised, hot antiseptic drops are indicated. These may be composed of equal parts of carbolic acid, tincture of iodine, and glycerin, or of boracic acid 15 grains, alcohol 1 drachm, rose water q. s. 1 ounce. If a sedative is still needed morphine or tincture of opium can be added. The ear should be still protected from the cold by a bandage.

Earache after the drum has been incised or after it has perforated shows one of two things: there is poor drainage or there is a rather severe infection. If the hole in the drum is too small, as seen after the canal has been irrigated with some hot solution (boracic acid is a good one), the opening should be made larger after anesthesia has been secured, as already indicated. We will save time, give comfort to our patient, and hasten his recovery by enlarging the opening. As a rule, it is best to make two incisions in these cases, making the first cut down from the perforation and the second one backward, thus permitting the wound to gap and give drainage.

If the pain is due to severe infection, the general condition of the patient deserves attention. Laxatives should be ordered, and the patient should be put to bed and kept there as long as he has fever. The ear should be irrigated with antiseptic non-irritating solution. Boracic acid solution, weak carbolic acid, or weak bichloride solution is efficient. Wilkinson doubts the wisdom of using dioxygen in these cases. He has always felt that there was some possibility of extending the infection into the antrum by means of its use. The ear should be irrigated as often as every two hours in cases in which the discharge is free and acrid—*i.e.*, when it causes the external canal to become sore. As the discharge decreases, longer intervals should be allowed between the syringing. In this class of cases Wilkinson has found hot drops of atropine, morphine, and chloral of benefit. He often uses the following prescription:

> Morphinæ sulph., grs. ij;
> Atropinæ sulph., grs. iij;
> Chloral. hydratis, grs. v;
> Glycerini, q. s. f℥ss.

Sig.: Use five drops in ear hot every half-hour until relieved.

Many aurists prefer the carbolic acid and glycerin drops, using from 1- to 5-per-cent solution, but Wilkinson is prejudiced against these drops after the drum is opened, as he believes they have a tendency to cause the opening to close too soon.

EDITORIAL.

ASSOCIATED PULMONARY AND CARDIAC DISEASE.

The general practitioner is prone, because of the pressure under which he works, to be content with a diagnosis, or recognition, of a single condition which is sufficient to account for the chief symptoms from which the patient is suffering. For this reason the fact is often overlooked that because a man has one disease this is no reason why he should not have in association with it one or two other diseases. Not infrequently the second or third malady, numerically speaking, becomes, or, perhaps, is from the first, the dominant one, but the physician naturally pays attention to the first condition which he has recognized, and possibly wonders why the patient does not respond to treatment.

An interesting statement of this general proposition as it applies to thoracic lesions, secondary to heart disease, was published by Brooks in the *Journal of the Medical Society of the State of New Jersey* for June, 1915. While it has been recognized for many years that changes in the lungs or pleura often complicate cardiac lesions, nevertheless the reiteration of this fact is timely, and Brooks has done well to call attention to it once more. For some of the pulmonary conditions, which are secondary to cardiac lesions, there is little that can be done by direct treatment, as, for example, a case of pulmonary infarction. In most of the other states which are induced the skilful physician may give a patient so much relief that he is not only relieved of great suffering and distress, but the condition of the heart is improved, not only by direct treatment, but also indirectly in that nervous stress and strain, coupled with mental anxiety, are removed and the labor of the heart materially decreased. A patient who is sufficiently ill, when suffering from cardiac lesions, to be confined to bed, may develop with more or less suddenness a considerable degree of hypostatic congestion at the base of the lungs, and unless this part of the lungs is examined daily the physician will overlook this state, the more so if he is content with merely ausculting the anterior portion of the chest at the time of listening to the heart sounds to discover if they have undergone any notable change. This hypostatic congestion can be benefited and often avoided if the posture of the patient is changed from time to time so that he does not remain continually in the dorsal decubitus. He can also sometimes be benefited by the application of dry cups and active stimulation of the heart through the employment of a few doses of some rapidly acting stimulant, like aromatic spirit of ammonia, or by the use of a few large doses of digitalis, whereby the right heart is enabled to drive the blood through the lungs with greater vigor.

In other instances the development of marked orthopnea causes the physician to suppose that the heart is broken down much more seriously than he had supposed, and this leads to more active medication directed to the heart, when a careful examination of the chest would have shown that the shortness of breath was induced by the presence of a more or less profuse hydrothorax. It will be recalled that this form of hydrothorax is most commonly found upon the right side; the explanation of this fact being, as has been so well pointed out by Fetterolf and Landis, by the pressure of a dilated right auricle upon the pulmonary veins, with the result that transudation takes place from the visceral layer of the pleura.

In those cases in which there is considerable cyanosis, jugular distention, and manifestations of general venous stasis occurring as an acute manifestation or developing slowly, there can be little doubt that the practice of venesection, associated with free cardiac stimulation and the relief of hepatic congestion by free purgation, very often gives great relief.

Although hypostatic congestion may threaten life if measures are not promptly taken to combat and overcome it, it is to be

considered, as a rule, a manifestation of gradually developed circulatory feebleness, whereas, on the other hand, the occurrence of so-called pulmonary edema is usually met with in cases of hypertension, and occurs as a sudden complication in patients who have for months or years suffered from high arterial pressure, which, combined with the progress of pathological changes in the heart muscle and in the blood-vessels, finally results in profuse transudation into the pulmonary tissues. Strictly speaking the pulmonary edema, although in reality due to high blood-pressure, is often associated at the time of its occurrence with a sudden drop in pressure which possibly is responsible for its occurrence. In our experience pulmonary edema is best relieved by the very free administration of atropine hypodermically, this drug being injected into some part of the body in which we have reason to believe it will be rapidly absorbed. Our opinion is in accord with that of Brooks that venesection is not suitable to these cases, although active purgation sometimes seems to do good. If there is much mental distress the association of a quarter of a grain of morphine with 1/100 of atropine is often most advantages. Brooks thinks that deep intramuscular injections of pituitrin or adrenalin, using from 10 to 20 drops of the usual 1-to-1000 solution, associated with absolute rest, is possibly the best treatment.

Chronic cardiac disease lasting over many years in association with chronic bronchitis often seems to be responsible for bronchiectasis, and in such cases the combined use of digitalis and stimulating expectorants is wise.

It not infrequently occurs that a patient presents himself suffering from chronic cough and expectoration, with the result that a diagnosis of bronchitis is made. Expectorants are given with little or no benefit, when, if the heart had been examined, the physician would have recognized the fact that digitalis or strophanthus would clear up the bronchitis by improving the circulation of the lung, which because of its impairment has diminished the vitality of the tissues so that the bronchial mucous membrane became unusually susceptible to infection. It sometimes happens that the absence of a murmur leads the careless physician to the conclusion that there is nothing wrong with the heart, when in reality this absence should make him consider whether the heart muscle was not so feeble that it is unable to produce a murmur. So, too, in myocardial degeneration, with or without associated valvular disease, the feeble or distant first sound may indicate to the educated ear that the heart needs more attention than the condition of the lungs.

STIMULANT DIURETICS IN ACUTE NEPHRITIS.

We believe that it is generally considered by clinicians that substances which are stimulating in their action are prone to be somewhat irritating, and that for this reason stimulants are often contraindicated when disturbance of function arises as the result of acute or subacute inflammatory processes. There is, however, little experimental, or so-called scientific, evidence to support this view, it being arrived at by a process of reasoning rather than by direct experimental work. Such experimental results are, however, beginning to be presented to us, although it is very evident that when acute or subacute nephritis is induced in the kidneys of animals by the use of irritant substances like cantharides, uranium, or other irritants, the condition is not identical with subacute or chronic nephritis, which are forms of renal disease most commonly met with in practice.

In the *Archives of Internal Medicine* of June 15, 1915, O'Hare reported an investigation as to the influence of theobromine sodium salicylate (diuretin) in acute chromate nephritis induced in rabbits. It is interesting to note that in the tubular nephritis caused by potassium bichromate the administration of theobromine sodium salicylate, which is designed to increase the urinary flow, rendered scanty by the inflammatory process, was found to shorten the

life of the animal, although in mild cases it seemed sometimes to prolong it. More important, O'Hare concluded that, on the whole, this drug seems to increase the lesion in the kidney and to hinder excretion of water, phenolsulphonephthalein, and possibly nitrogen. While this research does not conclusively prove the point, it certainly indicates what we have always taught, namely, that in the presence of acute or subacute inflammatory conditions in the kidney, indicated chiefly, from the clinical standpoint, by the presence of red blood cells in the urine, the administration of stimulant diuretics is unwise.

A NOTE ON MERCURIAL POISONING.

Poisoning by bichloride of mercury is so common that any contribution on the treatment of this condition, or to our knowledge of the lesions which are produced by the ingestion of this virulent poison, is of interest and importance. For this reason we think it worth while to call the attention of our readers to a paper by Kahn, Andrews and Anderson, which appeared in the *Medical Record* of August 28, 1915, in which they report a case of an adult who swallowed between 25 and 50 grammes of bichloride of mercury with suicidal intent. He speedily went into a condition of shock and developed coma, and ultimately died, but although the case had this unfortunate ending, it was found that washing out the large bowel with gallons of saline solution prevented the development of severe colitis which is so commonly met with in this form of acute poisoning. These investigators saved the fluid so used, and found upon careful chemical analysis of almost every tissue of the body that the largest amount of mercury was obtainable from the irrigation fluid, which would seem to indicate that colonic washing is to be employed in all cases. The liver, as is the case in so many forms of metallic poisoning, was the organ which contained the largest quantity of the drug. Thus this organ was found to contain no less than 19.3 milligrammes in 100 grammes of tissue analyzed, or 303.01 milligrammes in the entire organ. The kidneys were the organs which contained the next largest quantity of the drug, 13.7 milligrammes in 100 grammes of tissue, or 39.74 milligrammes in the entire organs. The spleen contained 8.4 milligrammes in 100 grammes of tissue, or 23.1 milligrammes in the whole organ. It is interesting to note that the thyroid contained 5.3 milligrammes in 100 grammes of tissue. The total amount of mercury chloride recovered from the first washing of the large bowel was 2725.5 milligrammes, and from the second washing 82.7 milligrammes.

Of course, the administration of egg-albumen is still to be regarded as the best antidote by the mouth, but, aside from the medicolegal importance of this research, the colonic irrigation would seem to be a matter for the practitioner to bear in mind should he be called to treat this form of poisoning.

THE VALUE OF THE LACTIC ACID BACILLUS.

It is one of the ironies of fate that the reputation of Metchnikoff rests, in the minds of many of the medical profession, and certainly amongst the laity, upon his suggestion that the lactic acid bacillus, by preventing the growth of putrefactive organisms in the alimentary canal, exercises an advantageous therapeutic effect. When the suggestion first appeared some enthusiasts went so far as to claim that the degenerative changes, which are coincident with advanced years, are dependent upon the absorption of poisons made by putrefactive organisms, and that the constant ingestion of lactic acid bacilli would prolong youth and increase the span of life. It goes without saying that such views are erroneous, and that while the lactic acid bacillus is of considerable value in a limited class of cases, it is by no means a cure-all and, like all remedial agents capable of doing good, is capable of doing harm if administered when its effects are capable of increasing rather than dimin-

ishing the difficulties under which the patient labors. Briefly stated, it may be said that when putrefactive organisms are breaking down protein substances a pure culture of the lactic acid bacillus may be administered in many instances with advantage. Whereas, on the other hand, if the digestive disturbance is due to the fermentation of starches or sugars it will make matters worse, increasing the fermentation and the acidity.

It is interesting in this connection to remember that Herter and Kendall as long ago as 1908 showed that it was possible, by feeding monkeys for two weeks on nothing else but milk containing the bacillus bulgaricus, to induce or maintain the acid reaction from one end of the alimentary canal to the other, but they also found that its efficiency was chiefly above the ileocecal valve, which, of course, is not the area in which a large amount of absorption of putrefactive production takes place. The important part of the alimentary canal in such a process is therefore comparatively little influenced.

More recently Raehe has gone much further and shown that this bacillus does not grow readily in the colon, although it seems to be able to survive over a considerable period of time in the small intestine, multiplying there and adjusting itself to the conditions which exist.

It is unfortunate, but nevertheless true, that remedial agents are found sooner or later to possess distinct limitations of value. It is perhaps even more unfortunate that they are, when first brought forward, received with so much enthusiasm that erroneous conceptions of their actual value are widely disseminated, and being widely disseminated are correspondingly persistent, with the result that they are used carelessly, or distinctly abused, and, what is worse, the patient for whom they are prescribed may be also abused. The moral is that the physician must have a clear idea of what he ought to do and a definite understanding as to what his remedies can do.

INTESTINAL DRAINAGE AND SEPTIC PERITONITIS.

At this present day when the recognition of the enormous protective power exerted by an untraumatized peritoneum seems well-nigh universal, and when the surgeon contents himself in critical cases with the least possible handling, the notes of a series of cases reported by Nyulasy (*Lancet*, Oct: 9, 1915) are illuminating. The first one recorded is that of a woman eighty years old, on whom he practiced curettage, excision of a cyst of the right ovary, and looping of the left ovarian ligament, hysteropexy, and appendicectomy for subacute appendicitis. The following day the patient suffered pain, and the second day she was what the reporter calls "collapsed," with a temperature of 97° F. and a pulse of 140, but refused operation until a week later, when it was noted that her condition had become very grave, with a fluctuating temperature, with a pulse of 120 to 140, blood, feces, and flatus passing. Nine days after her first operation because of her continued illness a rubber tube was purse-strung into her cecum. A week later an enema came out through this cecal tube and also out of the lower end of the suprapubic incision. Both openings closed in a few weeks. The reporter states the appendix was removed by an assistant, and attributes the ill consequences that followed to a lack of skill on the part of this unnamed youth. To the reader this case is valuable, since it increases his already high respect for the resistant powers of the peritoneum.

The second case was curetted, salpingectomized, and oöphorectomized, also hysteropexed. There was no mention of any postoperative symptoms, but a casual incision was made a few days later over the cecum and pus was found to well up from the locality of the uterus, the infection supposedly coming from what was described as a small, hard lump at the end of the uterine ligament found at the time of the original operation to contain about half a drachm of yellowish pus. Somewhat later the patient became bloated, with a pulse of

140. The surgeon, fearing that the intestine might possibly burst, performed an enterostomy through the upper end of a suprapubic incision, which reached to the umbilicus. The most convenient loop was brought up, stitched to the subcutaneous fat, and a tube inserted. As a final touch the author states that "the blood-stained fluid in the abdomen was only roughly mopped up." This patient was discharged in about six weeks with all wounds healed. A further tribute to the powers of the peritoneum when sick and insulted!

A third patient, twenty-two years old, entered the hospital with a three-months criminal abortion and had her uterus promptly cleaned out. It is observed that she "deteriorated, looked pale and distressed, had a drying tongue, and a pulse of 135." On opening the abdomen blood-stained fluid filled the pelvis. After breaking down adhesions a right tubo-ovarian abscess containing foul pus was found. The patient continued to deteriorate, the face still being pale and drawn. It is true the bowels were acting with purges and enema. There was only slight vomiting and the patient became bloated. Cecostomy was performed, at the same time turbid fluid being mopped out from the pelvis. Douglas's pouch was also opened through the vagina and gave exit to thin, stinking pus. It is noted that this patient did well.

The fourth case had densely and extensively adherent pus sacs excised, it being noted that the stump of the left broad ligament was so friable that ligatures cut through it as though it were cheese. The inflamed appendix was also removed. Again this patient progressively deteriorated, and in forty-eight hours after operation was in a very grave state. As in the former cases she looked drawn and anxious. The pulse-rate was 140, temperature 97°, and she became bloated. On opening the abdomen over the cecum a good deal of watery, blood-stained fluid appeared, and was fairly well mopped out. A rubber drainage-tube was fixed in the cecum. The original wound was then opened, and more fluid was mopped out of the pelvis and a rubber tube inserted. Two and a half days after these procedures it is noted that the patient was reading the newspaper.

The next case of double salpingectomy was so profoundly shocked by the operation that she could not be placed in the Fowler position until the next day. As in the former cases she deteriorated. It is somewhat keenly observed that a great change for the worse took place. Not only was the face pale and the lips livid, but the nose was pinched and the pulse-rate 144. Again the pelvic cavity of this patient was mopped, and a rubber tube was fixed in the cecum. A pean of victory can be detected in what might be called the commonplace observation of the author that "on the fifth day she was taking fish."

And, finally, there is a case of ectopic gestation ruptured three weeks before observation, her pallor having that "dirty" appearance suggesting sepsis. At the time of operation, after opening the abdomen, removing the fetus and a well-developed placenta, double salpingectomy was done. The reporter ingenuously states that "in spite of many swabs and much saline, it was found impossible to cleanse the abdomen of clots." Two days later he notes that fecal vomiting had set in and that 20 ounces of fluid had been brought up at one bout, which was strikingly fecal in odor and in every way suggested the bowel contents. Vomiting thence onward was continuous and profuse, 18 ounces being brought up about noon. The pulse at the time of the second operation was 160 and the temperature 96.4°. There was great bloating, and this patient looked intensely pale and ill. At the time of the second operation there is an honest admission that no attempt was made thoroughly to get at the fluid in the abdomen, only the accessible surplus being mopped away. The cecum was tubed, and in twenty hours the patient was taking milk and manifesting an interest in her dietary. Barring a right basic pneumonia the progress to convalescence was uneventful.

These case reports are of interest, not because they recall the therapeusis of

another day, nor solely because they show the enormous resisting power of the peritoneum, but rather because they seem to indicate that cecostomy has its uses, and that even in patients hopelessly traumatized and infected when the Fowler position and the Murphy drip are unable to exert their life-saving functions, providing an intestinal paresis be not wide-spread and complete, cecal drainage may be a valuable procedure.

THE TREATMENT OF EMPYEMA.

The treatment of empyema is a subject always of vivid interest to the medical profession, because cases of this affection are so frequent as to come under the attention of all practitioners. The term as used implies pus in the pleural space and pus due to the usual pyogenic organisms; the pneumococcus being the one most commonly encountered, the streptococcus, the colon bacillus, the gas bacillus, and others being less frequent. In the present war the gas bacillus has been, as in the case with wounds in other parts of the body, the dominant factor in fatalities. In practice empyema is nearly always secondary to bronchopneumonia. Incidentally it follows perinephritic abscess, subdiaphragmatic abscess, acute osteomyelitis in the vertebra or ribs. It is chiefly with the empyema following pneumonia that the general practitioner is concerned, and in large measure the success in the operative procedures is dependent upon his early recognition of the presence of pus in the pleura. The low mortality of the present day is in the main incident to this earlier diagnosis and the prompter treatment, since it must be confessed that the methods of dealing with the condition are not materially better than they were twenty years ago. The diagnosis should be framed in the first place upon the continuance of septic symptoms, or even their aggravation beyond that period when pneumonia should go.

A wise practitioner has enunciated the doctrine that there is no such thing as an unresolved pneumonia, and that the symptoms so often attributed to this condition are in reality due to a lung abscess, which is rare, or to an empyema, which is common. It may well be that lung abscess is not as rare as supposed, since in autopsied cases of pneumonia some 20 per cent are found to exhibit abscess. It is clinically true, however, that if these abscesses be common they undergo spontaneous drainage and resolution as a rule, and that a collection of pus in the lung amenable to surgical treatment is a rarity. To the surgeon at least the diagnostic signs are in the main dulness or flatness on percussion, displacement of the heart, and absent fremitus, further corroborated by an aspiration done with an exploring needle. The problem presented to him is to get rid of the pus and have the lung take its place, apparently not a difficult one of solution, since the cavity is readily accessible either between the ribs or after resection of one or more of these, when an aperture of practically any size may be made and maintained.

The practical difficulty lies not in the introduction of the drain, but in keeping it effectual. The usual history of these cases is the prompt subsidence of septic symptoms lasting from one to three or five days following drainage; thereafter a recrudescence of fever with diminution or entire stoppage of the discharge from the suppurating cavity. This may be due to one of two causes. The usual cause is the blocking of the drainage tube by thick masses of fibrin characteristic of a pneumococcic infection. The other is due to adhesions forming about the drainage-tube and guarding the communication between its end and one or more pus cavities. This blockage may be avoided in part by making an adequate opening in the first place, except in patients profoundly ill, a loosening and clearing out of the fibrinous deposits, at the same time making one, two, or three openings through the chest wall and placing drainage tubes of adequate size in each. In large accumulations with patients critically ill the preliminary drainage is best accomplished by thorough local anesthesia between the ribs and down to the pleura, skin incision,

the introduction into the pus sac of a round-pointed trocar and cannula, the passage through the cannula on withdrawal of the trocar of a tube which easily fits it, the withdrawal of the cannula, the securing of the tube in place by a stitch, and the connecting of the tube to a Wolff bottle placed on the floor by the patient's bedside, thus giving a negative pressure and forcing the lung to take the place of the pus as it flows out. Such drainage remains air-tight for at least twenty-four hours, and practically so for several days, but unless the infection be streptococcic and the pus be thin, it shortly becomes inadequate because of blockage, and even in the streptococcic cases may become so, due to blocking off by adhesions. The patient, however, will be in good shape to stand a wider opening with a few days of lessened sepsis and pressure. The wide opening and the rib resection can be made entirely painless by local anesthesia, which should usually be employed.

Against collapse of the lung positive pressure in the form of tracheal insufflation of ether has sometimes been advised. For empyema it is difficult to imagine circumstances for which it would be indicated. At the time of opening collapse of the lung may be expected. In unilateral cases this is not of serious moment. The lung inflates fully with each coughing effort, since the glottis is thus closed and the air from the sound side is driven over into the affected lung. On the proper application of a valve made of rubber dam the resultant pneumothorax rapidly becomes less. This rubber-dam valve is so framed that air can escape much more readily than it can enter. It is most easily arranged by strapping a piece of rubber dam in such wise that it drops across the end of a rubber tube leading from the chest and cut flush with the surface. Expiration blows it away; inspiration sucks it into the opening and also close to the wound. Cotton remarks that the cases of empyema which have gotten well in the past have often done so simply because the pus poultice with which they were dressed became in itself a valve. It is undoubtedly true that the present mortality of empyema has been lowered, and the number of cases relapsing into the chronic form are less than was the case twenty years ago. The credit for this can be laid to the doors of the doctors rather than the surgeons, since the better results are due to earlier diagnosis and earlier efficient treatment.

THE DURATION OF TREATMENT IN FIFTEEN HUNDRED CASES OF MILITARY SURGERY.

Under this title RAE (*Lancet*, Oct. 2, 1915), in the interest of enabling the surgeon and the physician to forecast how long a period must elapse before a patient will regain the condition of health which was his prior to illness, has undertaken an investigation based on the practice of the Connaught Hospital, to which are attached thirteen auxiliary hospitals where the patients are transferred as soon as it is safe to do so after their admission. In these hospitals treatment is pursued until such a time as it is considered no longer necessary, when the patients are returned to the Connaught Hospital for disposal. Cases used for study did not include any who died after they were returned to the Connaught Hospital, any who were discharged as medically unfit for military service, or any about whose diagnosis there was doubt; the sole object of the investigation being to establish the period of convalescence. In expressing the results the term "convalescent days" is applied to the stay in the auxiliary hospital. Rae states that these figures cannot be applied to ordinary civilian practice since they refer to males only and males of a picked class, and furthermore that these males are under the care of the medical and surgical staff, which varies far more markedly than that of the civilian general hospital. In a large number of cases synovitis and displaced semilunar cartilage and sprain are reported. Among the medical cases acute respiratory diseases supply nearly one-half the total, and bronchitis and rheumatism account for almost one-third. The average duration of "convalescence" in a surgical case was over

twenty-eight days, and in a medical case over twenty-five days. The total cost of these "convalescent days" to all the auxiliary hospitals was over $30,000, for which sum a battalion and a half were restored to health. In looking over the list of diseases it is gratifying to note that there is not a single instance of gonorrhea or syphilis.

Taking up surgical conditions in detail the civilian surgeon will be surprised that displaced semilunar cartilage required 538 days with 10 cases; of the 55 hernias the average number of days under treatment for each was over 44; thirty-four days for hemorrhoids; 50 days for varicocele; 42 days for varicose veins; and 39 days for cryptorchidism, of which there was one case. Forty-one days were required for fistula in ano, 110 days for fractured patella, and 205 days for fractured femur.

Just what is meant by the term rheumatism is difficult to determine. Large numbers were thus afflicted, both in the expeditionary force and in those under training. The rheumatic case was under treatment on an average about 45 days.

Because of the entire lack of detail with which the report is published it is impossible to determine whether the period needful to return these men to duty be comparatively long or short. It does seem, however, that a case of hydrocele should not have been kept 51 days under treatment; that an average of 49 days is somewhat long for urethral stricture; and that an average of 50 days incapacity is much more than is commonly allowed in a syphilitic orchitis. As opposed to this, the surgeon who can turn back to duty fractures of the tibia and fibula, of which there were 12, in 55 days; of the astragalus, of which there was one, in 40 days; of tumors, of which there were five, in 43 days; or of the radius and ulna, of which there was one, in 31 days, is doing well, forming in fact a marked contrast to him who takes an average of 27 days to cure lipomas, of which there were three.

Such a report is deserving of high praise because of the toil needful for its compilation and because it was actuated by a kindly and uplifting spirit.

REPORTS ON THERAPEUTIC PROGRESS.

THE TREATMENT OF HEART DISEASE.

F. C. SHATTUCK in the *Boston Medical and Surgical Journal* of August 26, 1915, writes that watery catharsis does not weaken the dropsical heart patient, and it may be well to explain this to him. He is inclined to think we are not always bold enough in our use of hydragogues. Serous effusions, if marked or obstinate, are to be tapped. Drainage of the legs by Southey's tubes or a modification thereof may be a help. In cases of markedly overdistended right ventricle, and in these cases cyanosis is usually pronounced, venesection up to a pint or more may be the first procedure indicated. The effect is sometimes almost miraculous. A dozen leeches, followed by poulticing their bites, may have a similar effect in relieving the right heart and be a substitute for venesection, if this is for any reason thought to be undesirable. One of the upper quadrants of the abdomen is a convenient place for leeching. Bleeding may pave the way for direct cardiac treatment, digitalis, which is of no use before relief of the right ventricle, manifesting its power thereafter.

In all cases of heart dropsy Shattuck watches closely the amount of urine and is apt to try to increase it. The dropsy is not only a measure of cardiac efficiency, but also a hindrance thereto.

The diuretic action of calomel seems to be due, at least in part, to its effect on the renal cells. Shattuck avoids its use for this purpose if he believes the kidneys to be subject to more than passive congestion. He has seen a single dose of calomel salivate a nephritic. As a cardiac diuretic he has been

in the habit of giving three grains of calomel every four hours, enjoining special care of the teeth. Given thus, it does not seem to affect the bowels. If it acts on the kidneys at all it usually does so on the second or third day, though he has seen the effect first appear on the fifth.

The diuretic action of caffeine, and its first cousins, diuretin and theocin, is thought to be largely of vascular origin, though a direct action on the heart itself cannot, Shattuck thinks, be as yet absolutely denied. Diuretin, in his experience, has never been of avail in renal dropsies. In those of cardiac origin its effects may be temporarily very gratifying. He has been led to attach value to its action or failure to act in cases of cardiorenal dropsy as an aid in deciding whether the cardiac or the renal element is predominant at a given time.

The objection to the alkaline diuretics is that their use runs counter to the dry diet which is ordinarily desirable when the blood mass is too great. Fluids are to be limited, as far as is compatible with the comfort of the patient, and the resourceful physician will secure tolerance and a greater fluid restriction than the routinist. Otherwise, diet should be nutritious, easily digested, moderate in quality. Gastric flatulence is to be avoided or counteracted.

There are cases, and times in the course of cases, in which Shattuck believes wine or spirits, wisely used, to be of real service. Alcohol, unlike the rapid cardiac stimulants, such as camphor, aromatic ammonia, and ether, has some food value—calories, in modern parlance.

Direct stimulation of the myocardium is ordinarily desirable or necessary in conjunction with efforts to reduce the load. The members of the digitalis group are diuretics only in so far as they act on the myocardium, increasing its power, and thus raising the blood-pressure. It is to this group that we look for direct and lasting myocardial stimulation. At its head stands, of course, digitalis, the many preparations of which and the dosage, varying in size and frequency, Shattuck passes over, simply noting the advance in recent years in standardizing digitalis. The only other members of the group worth mentioning here are strophanthin and apocynum. He knows no digitalis preparation which can produce such a rapid effect as strophanthin and cymarin when given intravenously, and perhaps, also, intramuscularly. The latter drug he has never used.

As a rule it seems to him better to give only one of the members of the caffeine or digitalis groups at a time, pushing the dose until either the desired effect is produced or there is evidence that the system is under its influence. This he thinks a great therapeutic law, applicable broadly to all active drugs. Exceptionally, however, judicious combinations seem to work better than the single remedy. He emphasizes the fact that we can only guess as to whether myocardial change is of such nature and extent as to be possible of repair or compensatory adjustment. Therapeutically, therefore, is it not wise to assume that some measure of such power is present, and try to call it forth? Is there one of us who has not found himself mistaken in both directions? In the long run, it is better to err on the hopeful side.

The second major mark of cardiac failure is pain—angina.

This, as contrasted with edema, is suggestive of degenerative change, usually of the left ventricle, perhaps very local, and is the result of impeded coronary flow, to which spasm is superadded. Physical signs may be absolutely lacking, and diagnosis rest practically on a single symptom. Shattuck is inclined to think that angina is not recognized as often as it should be, some thinking that the pain cannot be of the nature unless agonizing. The pain is of all grades.

Although arteriosclerosis is common enough in hospital wards, we rarely there, or even in the out-patient department, see angina. The spasmodic element seems to be enhanced by a higher development of the nervous system than is common in hand workers. The treatment of anginal conditions falls into two natural divisions—that of the attack, mainly palliative, and that of the prevention of other attacks. A

patient subject to angina should never be without a nitrite ready for immediate use. Shattuck generally advises glonoin tablets as being, on the whole, more convenient. But amyl nitrite sometimes works better. It may be well to give a small dose before a necessary exertion, especially if this soon follows a meal, as a prophylactic against pain.

But the all-important therapy of angina, whether grave or relatively benign, is the regulation of the mode of life. The innocent and the grave cases vary more in prognosis than in therapy. Every effort should be made to avoid bringing on pain. In some cases it may be well to put the patient to bed for a week or two. Ordinarily, it is sufficient to limit activity to that which is compatible with comfort, remembering that upward inclines, a head wind, especially if cold, a full meal, straining at stool, venery, and emotional vagaries are all inimical. More or less of these the intelligent patient finds out for himself. But it is our business to go into details, hoping through patient and persistent precaution to bring about, sooner or later, such adjustment or compensation in the heart as may markedly prolong life and render it very tolerable. Here, as in other aspects of the senile heart, the sum of small advantages may add up to very great therapeutic value. Diet, bathing, occupation, temperament, are all to be carefully considered.

It does not seem to Shattuck that tobacco should be absolutely and always interdicted. A sick man should not be deprived of any legitimate consolation, and the varying tolerance of tobacco by different people is notorious. A smoking doctor is likely to be more merciful than a non-smoker, but each should be on guard against his personal prejudices.

The details of medicinal treatment of true angina depend somewhat on origin—whether this be infectious or non-infectious, and if infectious, whether of luetic or other origin. Medicinal treatment is usually of minor though still of real importance. Strychnine is to be avoided as tending to heighten reflex excitability. Digitalis is indicated only in so far as myocardial failure is suggested by symptoms other than pain. Small doses of potassium iodide can seldom be harmful, and seem to be of value even in non-luetic cases. How far this value is suggestive in origin is hard to say. The average patient to-day is no less willing to carry out other directions when reminded three times daily that he is under medical supervision.

USE OF CAFFEINE IN DIGITALIS ARRHYTHMIAS.

In the *American Journal of the Medical Sciences* for September, 1915, BARTON asserts that all the irregularities of the heart-beat which are brought about by digitalis tend to be removed by caffeine. Although in many cases digitalis arrhythmia will spontaneously disappear when the drug is stopped, instances arise, unfortunately too common, in which after prolonged digitalis administration the conductive system is so depressed that serious results may arise. Under these circumstances the administration of caffeine will be of service and is therefore strongly indicated. The action appears to be due to the increase in irritability of the conduction system produced by the caffeine, which antagonizes and finally overcomes the depressing effects which digitalis exerts upon the auriculoventricular bundle.

ACUTE PYELITIS OF PREGNANCY.

In the *Journal of the Medical Society of New Jersey* for September, 1915, PRICE states that the treatment consists of complete mental and physical rest, the elevation of the patient into a Fowler position, the use of a fluid diet, and the administration of urinary disinfectants such as urotropin 30 grains per day. If this medication causes tenesmus, as it occasionally does, benzoic acid or one of the benzoates may be used. It is well to remember that urotropin is particularly helpful in infections with the colon and typhoid bacilli. James Burnett, writing in the *International Clinics*, 1912,

urges the free use of potassium citrate; he recommends 30 grains every three hours till the urine is rendered strongly alkaline, then a reduction in the dosage. Poultices over the affected region often prove grateful, and cold sponging may be resorted to for the fever. Meara feels encouraged in the use of autogenous vaccines; he reports some cures. De Lee advises the knee-chest or elevated Sims position three times a day for ten-minute periods, and urges the use of vaccines only after delivery. In very rebellious cases Williams practices the induction of premature labor; he finds that as soon as the uterus is emptied of its contents and contracts firmly, the ureters, freed from the upward traction, at once assume a normal position, drainage is quickly established, and therefore a cure follows very soon.

Urologists urge ureteral catheterization and pelvic lavage with various astringent disinfectants. Geraghty favors pelvic lavage in uncomplicated cases of pyelitis, particularly if they show a chronic tendency. He experimented with various solutions such as argyrol, protargol, liquor formaldehydi, carbolic acid, aluminum acetate, and silver nitrate; he has concluded that silver nitrate and liquor formaldehydi are the most beneficial. He gradually increases the strength of the silver nitrate, using as high as five per cent in obstinate cases. It is his opinion that a case of pyelitis is not entirely cured until there is a persistent absence of pyogenic organisms and pus cells.

For the prophylaxis of acute pyelitis of pregnancy, one must be mindful of the hygienic and dietetic laws peculiarly applicable in this state; plenty of fresh air, wholesome unirritating food, warm clothing, frequent warm baths, and moderate exercise are essential. The strain on the urinary tract from the hyperfunctionation, incident to pregnancy, should be relieved by the occasional administration of a refrigerant diuretic, such as bitartrate of soda, and the danger of fecal stasis should be forestalled by keeping the bowels in good condition. Last, but by no means least, the examination of the urine of pregnant women should be made frequently and with more thoroughness than is usually accorded it; if albumin be present in more than a trace, the urine should be examined microscopically for the presence of pus cells and pyogenic organisms.

In conclusion the writer adds that in his opinion the pyelitis of pregnancy is a complication which is at present often overlooked. This is true, not so much because we are prone to be satisfied with a snapshot diagnosis, for nowadays scientific accuracy is the aim of even the most unassuming of practitioners of medicine, but more because our attention has not been called to this condition with sufficient emphasis and insistence. The writer feels convinced that all of us can recall instances in which painful, febrile states were concomitants of pregnancy, to which we gave such diagnoses as malaria, lumbago, or la grippe; some of these were undoubtedly cases of pyelitis. With a closer study of the signs and symptoms and a livelier appreciation of its possible incidence in pregnancy and also the puerperium, we will find this condition a more frequent complication than the present rather meager literature would lead one to believe.

THE INFLUENCE OF INTRAVENOUS INJECTIONS OF NEOSALVARSAN ON THE ARTERIAL BLOOD-PRESSURE.

ROLLESTON in the *British Medical Journal* of August 21, 1915, reaches these conclusions:

1. The average of both the systolic and diastolic blood-pressures on the days after the injection is generally lower than before injection, the fall in the systolic being slightly more marked than in the diastolic pressure. This fall, however, is very probably not a direct result of the action of the neosalvarsan, and, in part at least, may be due to rest in bed.

2. The blood-pressure seven hours after the intravenous injection of neosalvarsan is usually lower than it was before. The fall in the diastolic pressure is slightly less than

that of the systolic pressure. The fall cannot be explained as due to fever.

3. As compared with the blood-pressure taken seven hours after the intravenous injection of neosalvarsan, the average of the blood-pressure estimations on subsequent days is usually lower. This is more marked in the diastolic than in the systolic blood-pressure.

4. During the actual intravenous injection of neosalvarsan both the systolic and diastolic pressures are nearly always higher than on other occasions. This appears to be due to excitement. During the operation the pressures may vary considerably, the systolic blood-pressure being more affected than the diastolic.

5. The blood-pressure before the first injection of neosalvarsan is nearly always higher than the blood-pressure before the second injection of neosalvarsan, but here again mental excitement may be responsible.

6. Finally, the general effect of intravenous injections of neosalvarsan is rather to lower, certainly not to increase, the arterial blood-pressure.

VALUE OF RECTAL FEEDING.

ADLER in the *American Journal of the Medical Sciences* for October, 1915, states that every one having experience with rectal feeding by the introduction of a pint or more of liquid nourishment at a time is impressed with the discomfort and difficulties of continued nutrition by this means.

An examination of stools shows how little food is really absorbed. On this account, for the past four years, Adler has been using the drop method as first introduced by Murphy for saline solution.

Four to eight ounces of peptonized milk with one pint of 4-per-cent sugar solution has been given three times daily. This method can be kept up for two weeks without discomfort. In a few cases they have caused cramp-like pains for the first day or two. In one or two cases vomiting has been produced. In but one case has it been necessary to give up the rectal feeding.

That the nourishment is carried well up to the intestines is shown by his experience in a case of fecal fistula after an appendix operation.

The patient was unable to retain any food by mouth, and rectal drop feeding was attempted. The dressings became invariably soaked with the enema after a few hours, showing that the fluid had made its way without difficulty through the length of the colon.

With rectal enemata of bismuth suspension there is no difficulty in obtaining a complete picture of the colon, but bismuth never enters the ileum except in the unusual case of patent ileocecal valve.

With the drop method the same results were observed; no bismuth passed into the ileum.

In order to obtain some idea of absorption of rectal feedings by the Murphy method, metabolism investigations were made on cases of gastric and duodenal ulcer with no abnormality of nutrition. After the second day of artificial feeding, with nothing by mouth, the colonic intakes for four to six days in nitrogen were compared with the output in the urine and the return loss per rectum. Daily total nitrogen estimations of the urine were made, while all the matter passed per rectum in the same period was collected, dried to constant weight, and the total estimated by the Kjeldahl method.

The average loss of total nitrogen by urine and stool in these five cases was 12.9 gm. per day. The average loss in nitrogen from metabolized proteid as shown by the total nitrogen of urine was 11.7 gm. per day.

The largest amount of nitrogen Adler was able to supply daily by rectal feeding was 3.9 gm., of which 2.06 gm. were returned with stools. According to the observations of Fr. Müller, the stools of individuals taking absolutely no nourishment contain 0.2 gm. per day. With this deduction from the estimations of the return nitrogen Adler has in no case observed an absorption of more than 50 per cent of the proteid supplied, and it has fallen as low as

30 per cent. The average amount of nitrogen absorbed in these cases was 1.14 gm. per day.

When we compare the amount of nitrogen lost by these cases with the amount it was possible for them to absorb by colonic feeding, we realize how little we accomplish.

The difference between nutritional enteroclysis and normal salt enteroclysis was a little over one-tenth of the tissue albumin loss per day. Over the periods of time that rectal feeding is usually carried out this is from a practical standpoint an almost negligible quantity.

THE ATROPINE TREATMENT FOR THE EXUDATIVE DIATHESIS IN INFANCY.

LEOPOLD in the *American Journal of Diseases of Children* for October, 1915, recalls the fact that some years ago Czerny gave the name of "exudative diathesis" to a group of symptoms characterized by an exudation into the skin and mucous membranes. The skin of infants suffering from exudative diathesis shows some form of eczema, varying in grade from a very mild seborrhea to extensive infiltration, with excoriation. The so-called geographic tongue is seen in some cases. Catarrhal affections of the respiratory tract—coryza, pharyngitis, recurrent bronchitis, and asthma—make their appearance. A catarrh of the gastrointestinal tract is often present. General glandular enlargement with an enlarged spleen may be combined with one or more of the other manifestations. An eosinophilia is found in the blood examination of some of the cases. The exudative diathesis is generally encountered either in very obese or in very thin infants; some of the cases, however, are normal in weight and development.

The eczema, bronchitis, and asthma occurring in infants with other symptoms of exudative diathesis are occasionally very resistant to the ordinary methods of treatment. The very fat, overfed babies are at times greatly improved by reduction in diet with consequent loss in weight. The symptoms occurring in poorly nourished infants occasionally clear up rapidly with proper regulation of the diet and gain in weight. In both classes of cases external treatment of the eczema in the form of ointments is used in combination with the dietetic therapy. With the most carefully combined treatment, however, a certain proportion of the cases fail to improve. The eczema persists for many weeks, months, or even years, and there are recurrent attacks of asthma, bronchitis, and pneumonia. It is for these patients that the atropine treatment is advocated.

Before detailing Leopold's results a brief review of the development of the atropine therapy should be given. Although the cause of the exudative diathesis is unknown, Eppinger and Hess believe that it is an infantile form of vagotonia, and various manifestations are thus due to increased tone in the vagus system. With this theory in mind, Krasnogorski treated a number of infants, ill for many months with the manifestations of exudative diathesis, with atropine, a drug causing, as is well known, decrease of vagus irritability. Six infants, all under nine months of age, were treated. Four of them had suffered from severe grades of eczema and two from bronchitis and asthma. Cures followed administration of atropine in all these infants. No toxic effects, such as flushing and dryness of the skin, dilatation of the pupils, tachycardia, etc., were observed, and Krasnogorski therefore concluded that infants suffering from exudative diathesis were very tolerant to the drug.

During the past year Leopold has administered the atropine treatment to ten infants suffering from symptoms of the exudative diathesis—severe eczema, bronchitis, or asthma. Mild cases were not treated, for he believes that the best test of the efficacy of the atropine therapy is in the advanced and pronounced type. The patients were all institutional babies ranging in age from four months to two years, and were under constant medical supervision. Careful observations were made on the condition of the pupils, skin, pulse-rate, etc. Tempera-

tures were recorded several times daily. The infants under one year were weighed daily, and the older infants once or twice weekly. The results of the atropine treatment on the lesions of the exudative diathesis were excellent; and this despite the fact that no changes in diet were made, and no other drugs administered. One infant died during the period of observation. In this patient atropine had a beneficial effect on the eczema, but in no wise influenced the pulmonary condition, death following a terminal bronchopneumonia.

Atropine was used in a solution of 1 grain of atropine sulphate to 480 drops of water. Three drops of this solution were given on the first day of treatment, and if no untoward effects were observed the dose was increased 1 drop daily until patients received about 30 drops daily (equivalent to 1/16 grain of atropine sulphate). This last dose was given daily for one or more weeks until the manifest signs of the exudative diathesis had disappeared. Smaller doses were then administered for a few more days or weeks. In only one case did untoward manifestations appear; they were very mild, and did not recur after the initial dose of the atropine solution had been reduced. In no case was there any harmful result from the atropine treatment. It was clearly evident from the beginning that infants suffering from exudative diathesis were able to take large doses of atropine without showing toxic effects.

Whether the theory of Eppinger and Hess proves true or false, the fact remains that striking results were obtained in Leopold's series of cases by atropine treatment administered on that theory. From a study of these cases it is fair to conclude that atropine sulphate in increasing doses given over long periods of time is of great value in the treatment of those severe and obstinate manifestations (eczema, bronchitis, asthma) of the exudative diathesis which do not respond to the ordinary dietary and local treatment. It will be Leopold's further object to determine if repeated courses of atropine are required or if a single course will effect a permanent result.

THE SOY-BEAN AND CONDENSED MILK IN INFANT FEEDING.

In the *American Journal of the Medical Sciences* for October, 1915, RUHRÄH says that after a considerable amount of clinical experience he has found that the best method to begin feeding mixtures of soy-bean and condensed milk is to make a gruel composed of one level tablespoonful of soy flour, two level tablespoonfuls of barley flour, a pinch of salt, and one quart of water. This should be boiled for twenty minutes, or even longer, and the water lost in the cooking should be replaced. To this is added condensed milk, varying from 1 to 16 to 1 to 8, according to the age of the child and other circumstances. As a rule this will be found to agree admirably, and may be used in quantities varying from 2 to 8 ounces at a feeding. The feeding interval may be two, two and a half, or three hours, usually three hours, and occasionally, in difficult cases, this may be lengthened to three and a half or even four hours; but Ruhräh has not found this advisable in many cases. The amounts of condensed milk and the strength of the gruel may be varied according to circumstances, using weaker mixtures if there is vomiting, or if there are symptoms of indigestion, or if the stools, after a number of days, do not appear to be more or less normal. The stools of babies fed with soy-bean mixtures are slightly brownish in color, should be perfectly well digested and smooth, and not unlike in appearance those of babies that have been fed upon malted milk. In children who are not gaining, and yet who seem to be taking the gruel well, the amount of condensed milk may be increased to 1 to 8—that is, one ounce of condensed milk, with enough gruel to make 8 ounces, and in exceptional cases, even to 1 to 6, though Ruhräh has rarely found this either advisable or necessary. The gruels may vary in composition, and in older children they may be increased to double the strength advised above—that is, 2 level tablespoonfuls of soy flour and 4 of barley, and occasionally this may be increased still further. If the soy-bean is used too strong, or if it is used with-

out a sufficient amount of carbohydrate with it, as in perfectly plain gruels without either cereal flours or condensed milk, it is liable to cause thin, dark-colored, foul-smelling stools, owing to the high protein and fat content, and the very small amount of carbohydrate present.

These mixtures of condensed milk and soy-bean gruels will be found one of the most valuable additions to the dietary of the infant. On two occasions Ruhräh has encountered a curious idiosyncrasy for barley flour in these mixtures. Following administration of the gruel made with barley flour, there was a sudden and marked general edema, lasting several days. It so happened that he had seen this condition from barley gruel used alone, so that this was stopped in both instances, and the gruel subsequently made with wheat flour in place of the barley flour. In both instances a second attempt to replace the wheat flour with barley was followed by the same edema, so that there can be little question as to the cause of it. As in feeding any cooked food to infants, some antiscorbutic food should be given, and for this purpose orange juice in quantities from a teaspoonful to two tablespoonfuls may be used daily, or at intervals of several days, or even once a week. He has never seen a case of scurvy resulting from these mixtures, but in all cases in which the gruel was used over long periods of time some antiscorbutic food has been added.

The class of cases and circumstances in which this mixture is to be advised may be outlined as follows: When fresh milk cannot be obtained, or when the milk supply is very questionable; in summer, when there is some question concerning the milk supply, and then in instances where the infant is found to be incapable of digesting cow's milk. It will also be found useful in certain cases of intestinal indigestion in infants who, under ordinary circumstances, can digest cow's milk, but who have had their intestinal functions temporarily deranged. It may also be of service in cases of chronic vomiting, and particularly useful as a food after summer diarrhea. Without the condensed milk the gruel may be used as a food in many diarrheal conditions with considerable advantage, but as is the case with every other food, there are many instances in which it will not agree with the child. The use of soy-bean gruels alone without barley or some other cereal may be recommended under very exceptional circumstances. The failure to obtain proper results from the use of the soy-bean has been largely due to an attempt to use it without the addition of some cereal. In the past six years Ruhräh has had a sufficient amount of experience with this method of feeding to know that it can be used without any danger. It will not produce rickets, and with a very small amount of some antiscorbutic food will not produce scurvy. It permits a perfectly normal development as far as bones are concerned, and in successful feeding the infants present the appearance of breast-fed babies. In some of the most difficult cases children are slow to reach the normal appearance, but most of such children that he has had have been those whom he does not believe could have been raised by any other means or only by using a wet-nurse.

A CHEMICAL STUDY OF WOMAN'S MILK, ESPECIALLY ITS INORGANIC CONSTITUENTS.

In the *American Journal of Diseases of Children* for October, 1915, HOLT, COURTNEY and FALES reach the following conclusions on this subject:

1. The use of large individual samples of milk for analyses has advantages not offered by such small ones as have been commonly employed. For a determination of the inorganic constituents large samples are indispensable.

2. In the colostrum period woman's milk has high protein and high ash with rather low fat; in the transition period the protein and ash are lower while the fat is higher; in the mature period (after one month) the composition of normal milk does not vary in any essential or constant way quite up to the end of lactation. The only striking feature

of late milk is a decline in quantity, though there is noted a slight fall in all the solid constituents except the sugar.

3. Of the different constituents of milk the least variation both in individuals and in periods is seen in the sugar. The proportion of this is somewhat higher than the generally accepted 7 per cent; 7.5 per cent is nearer the correct figure.

4. The greatest individual variations are seen in the fat, though the period variations in fat are not marked.

5. The protein is highest in the colostrum period and falls to a little over half the proportion in mature milk, during which period it is seldom over 1.25 per cent; of this about one-third is casein, and two-thirds lactalbumin.

6. The high ash of the colostrum period is chiefly due to the amount of Na_2O and K_2O. Of the salts which make up the ash, the greatest individual, as well as the greatest period, variations are seen in the Na_2O; the least individual and period variations are seen in the CaO, the proportion of which is nearly constant throughout the period of lactation.

7. The largest constituent of the ash of woman's milk is K_2O; this with the CaO together make up more than half the total ash.

8. Although in amount the total ash of cow's milk is about three and one-half times as great as that of woman's milk, the proportion of different salts which make up the ash is nearly the same, the only exceptions being that cow's milk has more P_2O_5 and less iron.

THE PRACTICAL USE OF COPPER SULPHATE IN SWIMMING POOLS.

S. J. THOMAS in the *Journal of the American Medical Association* of September 25, 1915, says that on analysis the pool water in the Taylor Gymnasium at Lehigh University was shown to contain, just after filtration and before any one entered the pool, 10 bacteria per cubic centimeter, and no colon bacilli; after 40 men had been in the pool, although all the preliminary sanitary precautions had been taken, the water contained 5300 bacteria per cubic centimeter, 200 of which were colon bacilli. Bleaching powder introduced into the pool in germicidal quantities is out of the question on account of its disagreeable odor and its irritating effect on the eyes and mucous membrane. Copper sulphate can be used in germicidal quantities without any disagreeable results.

The method of using copper sulphate is very simple. Thomas found as the results of experiments that about one-twentieth (0.04) part of the copper sulphate to a million parts of water, used every day, kept the water pure. This amount cannot be recommended absolutely for every pool. The chemical contents of the fresh water, the number of bathers, the frequency of refiltration, etc., are factors that should not be overlooked. However, for most pools averaging not more than from 100 to 150 bathers per day, and in which the proper care is taken, this amount will prove the proper one.

In order to determine in pounds the amount of copper sulphate to add, the capacity of the pool must first be determined. In the case in which this is known as a certain number of gallons, the problem simply amounts to multiplying the number of gallons capacity by 8.3 (the weight in pounds of a gallon of water), and dividing the weight of the water thus determined by 2,000,000 (the solution being one-half part per million). The result is the weight in pounds of copper sulphate to be added. For example, suppose the pool contains 90,000 gallons of water:

90,000 x 8.3÷2,000,000=0.37 pounds, or about 6 ounces, of copper sulphate to be used.

In case the capacity of the pool is not known, it may be determined as follows: Multiply the length in feet by the width in feet, and the result by the average depth in feet. This will give the capacity of the tank in cubic feet. As a cubic foot of water weighs 62.5 pounds, we now have the formula:

Length x width x average depth x 62.5÷2,000,000=weight of copper sulphate to be used.

The copper sulphate should be added

daily. The method of introduction consists simply in dissolving the required amount, placed in a small bag, such as a 5-cent salt sack, directly in the pool, either by dragging the bag through the pool by means of a pole, or by throwing it into the pool as an object for the bathers to dive for. Another very easy way is to dissolve the disinfectant in a quart or two of water and pour this solution into the pool. No more than enough solution for one treatment should be prepared at one time if it is used in this way. The swimmers soon distribute the dissolved salt throughout the pool.

As to the time of treatment, it is best to use copper sulphate between the two most popular times for the pool, such as at noon if there are large morning and afternoon classes, and at supper-time if there are large afternoon and evening classes. To use any disinfectant just before or just after adding a large amount of fresh water is, of course, simply a waste.

Copper sulphate may be obtained at the present time under the commercial name of blue vitriol for about $7 per hundred pounds. One hundred pounds will last the average pool about a year.

TREATMENT OF SYPHILIS OF THE BRAIN.

In the *Journal of the American Medical Association* of September 25, 1915, IRELAND and WILSON state that the injection of 1/50 grain of mercuric chloride intradurally, by the method of Byrnes, is apparently safe.

Autogenous serum is much preferable to pooled serum.

The reactions are a little more severe than following the Swift and Ellis method of 40-per-cent salvarsanized serum.

A clinical improvement usually appears after about five treatments; 75 per cent of their cases showed this improvement.

A tendency to relapse to their former conditions was observed in about 40 per cent of those at first improved.

The clinical improvement is more marked and rapid than the serologic.

How permanent the improvement will be the writers are unable to state, as the time of observation is too short.

They are encouraged to continue this study, however, and a later report will be given on these patients after further treatment and observation.

The colloidal gold test is the most resistant to change.

It is possible to have clinical general paralysis with a negative Wassermann reaction in blood serum and spinal fluid, but in this series the colloidal gold test was uniformly positive.

The method employed is as follows: About 40 Cc. of blood is taken, under aseptic conditions, from one of the veins of the forearm, and the serum allowed to separate. To 12 Cc. of clear serum is added 1 Cc. of a sterile solution of mercuric chloride containing 1/50 grain, and 17 Cc. of sterile normal salt solution prepared from freshly distilled water. This total of 30 Cc. is heated to 56° C. in a water-bath for thirty minutes. Lumbar puncture is performed and from 15 to 30 Cc. of fluid is withdrawn, and the 30 Cc. of diluted mercurialized serum slowly injected. A 25-Cc. Lüer syringe is used.

In those cases in which neosalvarsan is given, the usual Swift and Ellis technique is used. The serum is administered within twenty-four hours of its preparation. The interval between injections is determined by the condition of the patient.

THE TREATMENT OF NERVOUS SYPHILIS.

RIGGS in the *Journal of the American Medical Association* of September 4, 1915, reaches these conclusions:

1. Every patient with constitutional syphilis, especially in the early stages, should be examined neurologically and serobiologically, and if there be found any symptoms of nervous involvement or an abnormality of the spinal fluid, intraspinal injections of salvarsanized serum should be given until a clinical and laboratory cure is effected. Bernstein advises this procedure as a pro-

phylactic measure in all cases of syphilis, particularly in the primary and secondary stages.

2. Lange's colloidal gold solution is a valuable aid in diagnosis, possessing a marked corroborative value. Paresis gives a characteristic curve (in over 90 per cent of our cases) so constant, say Grulee and Moody, that "one may venture a diagnosis without other findings, either clinical or laboratory." There is a distinctive tabetic curve which was present in 50 per cent of cases. The colloidal gold reaction differentiates clearly between paresis and cerebrospinal syphilis. In tuberculous meningitis the colloidal gold solution reacts markedly. Non-syphilitic cases sometimes give a vague discoloration which may or may not invade the syphilitic zone, but which has no special significance.

3. Intraspinal medication (Swift and Ellis method) is a sane and safe form of therapy, and in the hands of practical men is practically devoid of danger. In cerebrospinal syphilis and tabes, results obtained by conservative workers are most encouraging, and in some cases little less than marvelous. When paresis can be treated in the early, the toxic, stage, before serious degeneration of nervous tissue has ensued, an arrest of the disease may reasonably be expected. Is it too much to hope for a cure?

NITROUS OXIDE OXYGEN ANALGESIA IN OBSTETRICS.

In the *Chicago Medical Recorder* for September, 1915, LORENA CRAIG reports favorably on this method and advises, as the end of the first stage of labor approaches or whenever the physician deems it advisable, the gases be turned on, using about one-tenth of oxygen to nine-tenths of nitrous oxide. The breathing bag is filled with this mixture, and just before the uterine contraction comes on the nose-piece or face-mask is applied and the patient is directed to breathe deeply and rapidly, keeping the lips firmly closed (if the nose-piece only is used) so that none of the gas escapes through the mouth. Usually six or eight breaths are sufficient to produce analgesia, and the patient is able to work with her pains and yet to be unconscious of painful sensations.

With a little practice one soon determines the number of breaths required to carry the patient through each pain; in fact, the patient is able to control the administration almost entirely herself.

Among the various cases observed, the greatest length of time analgesia was employed was twenty-four hours. The patient had become discouraged and the pains were becoming less frequent and forcible before the administration of N_2O-O was started. After it was begun the contractions became somewhat more frequent and forceful and the patient more hopeful. More progress was made. The amount of N_2O consumed in this case was considered unusually low by Dr. Frank Lynch, who said he thought the small amount consumed was due to the efficiency of the apparatus. Of course, the analgesia was continued in this particular case for a much greater length of time than is usual.

The average length of the second stage of labor in 1500 cases is one hour and thirty-seven minutes, and ordinarily the administration of the analgesia is not begun until the end of the first or the beginning of the second stage. This matter, however, is left entirely to the discretion of the obstetrician.

The effectiveness of N_2O cannot be questioned after observing its use in a number of cases, for the first stage may be rather long and tedious, and as the pains become more frequent and severe with the approaching second stage, the patient becomes discouraged. But with the introduction of gas-oxygen analgesia a marked change is noticed and the patient is able to work with the contractions, knowing she will not be conscious of the intense pain of the more forceful contractions. Just before the expulsion the face mask is applied and a deeper anesthesia is brought about by the use of 2-per-cent O and 98-per-cent N_2O. At this time ether or chloroform vapor may also be added in a small cup at the side of the mask for this purpose, and the vapor

inhaled with the gas-oxygen without removal of the mask.

The question has been raised as to the superiority of oxygen and nitrous oxide over air with nitrous oxide, and Hewitt has stated that the objection to using air is that it contains a large percentage of nitrogen, which is useless for anesthetic purposes. He illustrates this in the following manner:

"In 40 per cent of air with 60 per cent of N_2O, 8 per cent of the air by volume is oxygen and 32 per cent is nitrogen. This mixture containing 8 per cent of oxygen would be the proper amount so far as oxygen is concerned, but 60 per cent of N_2O would not be sufficient to produce tranquil anesthesia; by using oxygen instead of air the 32 parts of nitrogen are replaced by a corresponding quantity of useful N_2O, and using the same percentage of oxygen there is a perfect anesthesia mixture."

Craig's observations have covered a period of about three months in various hospitals, recording the work and effects of different types of apparatus and the varied methods of administration; also the writer's own administration with private cases, using the apparatus designed by Dr. Will Walter, and these are her conclusions based upon this experience.

The most striking thing to her is the tranquillity of the subjects and their anxiety to coöperate; and particularly the often expressed paradox that they felt the pain, but that it did not hurt, meaning, the writer imagines, that they are conscious of pain but are able to endure it much easier than without the use of the gas. When on occasions they have said it did not help, the writer has let them have a pain without it, and they have been only too glad to have it for the next.

Aside from the safety of this apparatus, which is free from pressure, and its ease of control of percentages of the gases, the most useful element is the breathing valve-bag. By its use the bag is held full of the analgetic or anesthetic mixture and placed beside the patient; so that, upon the first sign of approaching pain, she may have the mask applied, and by opening the valve begin the inhalation. She may even do it herself—in fact, she may control the degree of her own analgesia voluntarily and with ease at all times, and she is able to describe the sensations accurately.

CASEIN-MILK IN INFANT FEEDING.

The *Journal of the American Medical Association* of September 4, 1915, contains an article by GELLHORN in which he says that in his experience casein-milk feedings have been found to be successful as temporary food in allaitement-mixte and when it was necessary to wean a very young child abruptly. Although they do not seem to produce any harm during prolonged use, the advantages they offer are not sufficiently clear to recommend their substitution for the ordinary milk modifications in normal children.

They cannot replace breast-milk in some of the severest cases, but in the great majority of nutritional disturbances, as seen in private practice, they will be found to be of assistance. They are indicated in disorders of a fermentative origin, and can be fed in such cases in rapidly increasing doses regardless of the stool picture, provided the child does not develop symptoms of alimentary intoxication. Through their use may be avoided the prolonged or repeated therapeutic hunger periods with their deteriorating influence on the child's organism, which are so frequently the cause of turning an originally mild into a serious disorder.

THE TREATMENT OF TYPHOID FEVER BY STOCK TYPHOID VACCINE.

In the *Lancet* of September 25, 1915, WILTSHIRE and MACGILLYCUDDY write on this topic and reach the following conclusions:

1. Stock typhoid vaccine is a valuable therapeutic agent for the treatment of typhoid fever.

2. The treatment should be started as early as possible with an initial dose of 250,000,000.

3. A reasonable suspicion that a patient

is suffering from typhoid fever is sufficient indication for commencing vaccine treatment.

4. The treatment is quite harmless to patients who may subsequently be proved not to be suffering from typhoid fever.

5. An interval of three days should be given between doses. Shorter intervals are not well tolerated. When a longer interval is given, if four days, the dose should not be increased; if over four days the dose should be reduced.

6. Great care must be used in dosage if secondary infections of the lung are present. If possible, the typhoid vaccine should be combined with a vaccine suitable for the secondary infection.

7. Doses should be continued for ten days after the temperature is normal as a preventive against relapse.

8. Preventive inoculation exerts slight, if any, influence on subsequent vaccine treatment.

THE ADVANTAGES OF QUININE AND UREA HYDROCHLORIDE AS A LOCAL ANESTHETIC.

In the *New York Medical Journal* of October 2, 1915, AMSTER reminds us that quinine and urea hydrochloride is a nontoxic double salt of quinine and urea. In other words, it is a carbamidated quinine dihydrochloride, containing seventy per cent of quinine and eleven per cent of urea. It is readily soluble in water and does not decompose on boiling. It is put up in ampoule form ready for use, but the writer prefers a freshly prepared solution, 0.125 to 0.25 per cent strength, which is made as follows: One tablet containing one and one-eighth grain of quinine and urea hydrochloride is dissolved in one to two fluidounces of sterile water, to which is added five to ten drops of adrenalin solution 1 to 1000. The operator is at liberty to use as much of this solution as the case may require without causing the untoward physiological or toxic symptoms that are sometimes met with after the local administration of cocaine and other dangerous drugs.

The field of operation is prepared in the ordinary way with iodine. The skin is slowly injected with the solution along the entire course of the desired incision, and the same process is carried out in treating the underlying structures, special care being taken against injuring or cutting nerves. In order to produce conduction anesthesia, the nerves should be carefully isolated, and then thoroughly infiltrated with the quinine solution. This procedure is indicated in operations for inguinal hernia, especially the strangulated type. Ordinarily, complete anesthesia is produced in fifteen to thirty minutes, and may last for an indefinite period. The prolonged anesthesia is explained by the infiltration of the nerves and the tissues with a granular fibrin, and the period of anesthesia depends entirely on how soon this fibrin is absorbed.

Gentle handling of the tissues and perfect technique help to prevent shock. Shock no doubt is the result of tugging and tearing tissues, which in turn cause a certain amount of unnecessary bleeding. Many patients object to the pain produced by the initial puncture of the hypodermic needle, but this is usually overcome by spraying the skin with ethyl chloride before the anesthetic is introduced. A preliminary injection of morphine and atropine may be given, an hour before operation, in nervous cases. An assistant or a nurse should always be at the patient's head to distract attention during the entire course of operation, and the patient's eyes should be covered and all unnecessary noises avoided.

Some operators use especially constructed syringes, but an ordinary glass syringe of 10-Cc. capacity will answer the purpose. Many men have had excellent results with quinine and urea hydrochloride, while others have apparently been unsuccessful with this method, their objections being sloughing of the tissues, incomplete anesthesia, or healing by second intention.

These poor results may be due to various causes.

Sloughing of the tissues. Many men have unfortunately encountered this complication, and, after inquiring into their cases very carefully, the writer was informed by

some of them that they had used solutions ranging from 0.5 to 3 per cent, and they had invariably administered stock solutions instead of using freshly prepared ones.

Incomplete anesthesia. The writer, personally, witnessed the technique of several men who now condemn local anesthesia, and discovered that their unsuccessful results appeared to be secondary to faulty technique, and not to quinine and urea. Instead of first anesthetizing the skin, they promptly injected the underlying tissues without treating the skin, and after a lapse of one or two minutes the operation was begun. As a result of this technique, their patients would squirm all over the table and would cry out with pain, so that general anesthesia would have to be resorted to in the end.

Healing by second intention. In performing operations under local anesthesia, especially minor operations, the writer has noticed that some men seem to forget the first principles of asepsis, and the care that is ordinarily taken in general narcosis is not followed out in the same degree with this mode of anesthesia. Other men, instead of taking pains slowly to inject the skin and underlying structures, hurriedly infiltrate the tissues, thus forcibly distending them with the solution, and they consequently get an analgesia that is produced by physical means, instead of depending on the action of the fibrin that is slowly deposited by the quinine and urea. A necrosis of tissue often results after such technique and delayed union follows. This series embraces the type of cases in which general anesthesia was contraindicated, such as cardiac and vascular diseases, pulmonary diseases, nephritis, profound anemias, senility, minor operations, and patients refusing general anesthesia.

The writer's experience with this mode of anesthesia covers a period of six years, and the results obtained thus far have been most gratifying. Postoperative pneumonia, a dreaded complication of general narcosis, is absolutely unheard of with the use of quinine and urea anesthesia. His group of cases covers a large field of surgery, including inguinal herniotomy, femoral herniotomy, appendicectomy, colostomy, cholecystostomy, salpingo-oöphorectomy, suprapubic cystotomy, tenorrhaphy, amputation of fingers and toes, rib resection for empyema, operation for pedunculated submucous uterine fibroid and polypus (vaginal route), laceration of cervix and perineum, urethral caruncle, inguinal and cervical adenitis, thrombosis on the internal saphenous vein, varicocele, hydrocele, enlarged prepuce, gangrene of testicle and epididymis, periprostatic abscess, ischiorectal abscess, hemorrhoids, carbuncle, epitheliomata of face and scalp, alveolar abscess, sebaceous cysts of scalp, lipomata, foreign bodies of hand and foot, ingrown toe-nails, exostosis of tibia and fibula, bursitis, abscess and benign tumor of breast, abscesses in other parts of the body, lacerated wounds, etc.

In this series, quinine and urea hydrochloride had been used exclusively, with the exception of an operation for a large ovarian cyst. Here an unusual amount of traction had been used in delivering the cyst, and it became necessary to administer a few whiffs of nitrous oxide. In another case, general anesthesia had to be resorted to for a few minutes in freeing an embedded retrocecal appendix.

PITUITRIN EXTRACT IN OBSTETRICS.

FRIEDMAN states in the *New York Medical Journal* of October 2, 1915, that according to most writers the ideal time to inject the extract is in the second stage. Friedman has used it, methodically, in the first as well as in the second, and has not seen any ill effects. P. A. Hendley emphasizes the fact that it is a valuable aid in shortening the long, and often exhausting, first stage of labor. It is also true that the third stage of labor is considerably shortened.

Pituitrin should, of course, not be used in typically normal cases, nor when such contraindications exist as obstruction, nephritis, or high blood-pressure suggesting an impending eclampsia.

Another good use of pituitrin is in the

differentiation of pregnancy and labor as pointed out by Buthin and Bandler: "Injection of hypophysis extract will start uterine contractions if pregnancy has reached term, but if not the effect is transient, and additional doses will have no effect." Since the drug can be used only to sensitize the uterus and not to stimulate contractions, it is quite easy to understand its action in such a procedure. In using this method as a test, it would not be wise to inject a full dose, since 0.33 Cc. will serve the purpose.

The addition of pituitrin to the obstetrical armamentarium has robbed the complication of placenta previa of its horrors and diminished risk as a bad omen in the third stage of labor. Hanah and Meyer, Madill and Allen reported good results in a number of cases of placenta previa. In Friedman's case of placenta prævia lateralis, the events of all the stages of labor simulated those of a normal one.

The few points to be remembered are these:

1. Small doses of pituitary extract act better than large ones.

2. Large doses are harmful, producing supersensitization of the uterus, thereby causing the danger of extensive laceration of the perineum and rupture of the uterus.

3. It is an excellent oxytocic, especially in placenta previa, and atony of the uterus.

4. Lastly and most important is that it is the "medicinal forceps," acting as a *vis a tergo* instead of a *vis a fronte.*

INTRASPINAL TREATMENT IN SYPHILIS, WITH ESPECIAL REFERENCE TO THE SPINAL FLUID FINDINGS.

In the *Medical Record* of October 2, 1915, LEVISON reaches these conclusions:

1. The effort to treat syphilis of the central nervous system by direct intraspinal injection has a rational basis in the inefficiency of treatment by the older methods and also from the results of intraspinal treatment by more recent methods in meningitis, poliomyelitism, and tetanus.

2. The cell count of the spinal fluid is a variable factor and cannot be utilized as a criterion of cure or improvement in a given case.

3. It is the consensus of opinion that therapeutic remedies administered by mouth or into the blood stream do not reach the spinal fluid in sufficient concentration to influence bacterial involvement of the central nervous system.

4. Intraspinal injections of salvarsanized serum or neosalvarsan in proper dosage is not a dangerous procedure in careful hands.

5. Intraspinal injections will relieve pain and a great many of the symptoms of syphilis of the central nervous system.

6. It is possible in some cases to render the laboratory tests of the spinal fluid negative if the treatment is continued sufficiently long.

7. The method should not be discarded, but continued until its proper place in therapeutics is definitely determined.

GALYL, A SUBSTITUTE FOR SALVARSAN AND NEOSALVARSAN.

FOERSTER in the *Lancet* of September 18, 1915, tells us that galyl is best administered by means of intravenous injections, as intramuscular injections are painful and may lead to necrosis, as does salvarsan. Any of the methods used for the latter drug are admissible. Personally, the writer prefers the infusion method, as it gives the best guarantee against infiltration of the soft tissues, and fairly concentrated solutions seem to him to be better borne than weak dilutions—a view which also applies to salvarsan and neosalvarsan.

The results have been excellent. An immediate—from the very next day on, as one patient remarked—improvement followed upon the administration of galyl, and all the lesions disappeared within a very short time. One injection is quite sufficient to heal a very large chancre, and mucous plaques heal in a very few days. All secondary rashes respond well and quickly. The effect upon the general health is that of a tonic.

Salvarsan, whether employed intravenously or intramuscularly, does not yield any

better results. With equal dosage it would be inferior. Even when the writer compares the results given by the first (experimental) tubes of salvarsan (606 Hy) with those obtained by galyl, he is unable to find any superiority for the German drug. Being one of those who had occasion to handle salvarsan before it became common property, and having used it ever since, he wishes to state that he is decidedly under the impression that the salvarsan sold of late by the German manufacturers is much less potent than the experimental tubes given out by Ehrlich in the beginning, and neosalvarsan is weaker still. Galyl appears to the writer to be superior to both salvarsan and neosalvarsan with regard to its symptomatic effect upon primary and secondary lesions. This is a considerable advantage, as these lesions are the most virulent and dangerous, and require a rapid cure owing to the risks they imply for the community.

With neosalvarsan galyl shares its solubility, which has made the former so popular.

All the writer's cases were injected under unfavorable conditions. Most of them had to come up by omnibus or train and returned immediately, or in less than two hours, to their homes. There can be no doubt that the ill effects could be reduced, or even excluded, if the patients were injected in a nursing home or hospital and were kept under observation.

Vomiting was noted once after the third injection. The patient brought up egg and other matter and confessed to having had breakfast only two hours previously. The vomiting in this instance was self-inflicted, and would certainly also have occurred had salvarsan or neosalvarsan been used.

With the doses 0.3 grm. and 0.4 grm. no ill effects were observed. With 0.5 grm. the following took place in three cases, and this seems to be the only drawback worth considering: Almost immediately after the injection the patient became flushed and slightly dyspneic. This was rapidly followed by pallor. The pulse became small and almost imperceptible, varying between 100 and 120. As the heart-beats became feeble the limbs became numb and cold. In one instance pain in the stomach was complained of. These phenomena, however, pass off very quickly, and in none of the writer's cases was there the slightest reason for alarm. Some people being more susceptible than others, all risks can be avoided by starting with small doses, excluding patients suffering from heart trouble, and allowing an interval of more than eight days between the injections. The vascular disturbance itself could be treated by means of intragluteal injections of adrenalin, as recommended by Milian for salvarsan disturbances, or, as the writer prefers, by means of a hypodermic injection of ether, if deemed necessary.

Galyl is akin to salvarsan in its composition, and therefore headache, slight fever, diarrhea, etc., may occasionally be noticed. These accidents are trivial and require no special comment.

The "therapia sterilisans magna" so bombastically proclaimed by Ehrlich and his followers was never taken seriously by the judicious, and the events have shown its futility. It would be unfair to the drug and to the patients were one to expect from a single injection of galyl a complete cure, and not to take advantage of the lessons taught by the experience with salvarsan. In the writer's opinion massive doses are to be deprecated. In the case of salvarsan they have given rise to more trouble than all the organic and inorganic "water faults" (Wechselmann, Emery) and other factors discovered by Ehrlich's partisans. Salvarsan poisoning is a serious matter, and there are, unfortunately, but few cases that come early enough to be aborted. In most cases a chronic intermittent treatment is indicated, as in former days. What has changed is the detail. Making use of the various remedies, tests, etc., at one's disposal, each case has to be treated according to its merits. The most rational procedure appears to the writer to consist in the removal of the urgent symptoms by means of a few injections of galyl, starting with 0.3 grm. in the case of adult males, and 0.2 grm. in

the case of females, and following this up with mercurial treatment. A rest is then given, and the treatment resumed in due course, guided by the serum reaction, and carried out as required in each individual case.

The writer is well aware that various important questions connected with the drug, such as its effect upon tertiary lesions, its influence upon the serum reaction, etc., require investigation, and that a great deal of further experience is necessary before a definite opinion can be formed on the merits and demerits of galyl. His clinical results, however, have been so encouraging, and he has seen most virulent syphilitic lesions heal so rapidly under its influence, that others may wish to give it a trial. As far as he can tell at this stage galyl appears to be "every bit as good" as salvarsan, and it is to be hoped that it may be tested more extensively.

Considering its price it may prove a blessing to military hospitals, infirmaries, and other large institutions.

THE IMPORTANCE OF THE PERSONAL EQUATION IN THE TREATMENT OF THE TUBERCULOUS.

The *Medical Record* of October 2, 1915, contains an article by SWAN in which he advances the following practical points:

Patients are sometimes worried and nagged by their overanxious and indiscreet family and friends. It may be a very difficult and delicate matter to handle, but often a patient's improvement will depend on the physician's detection and management of these incompatible people. Some one's facetious remark that a physician must also be a policeman, if he would successfully treat the tuberculous, contains much truth.

Worry about finances or anything else may do immense harm. Even though we may not be able to remove the cause of the worry, we may help the patient to be philosophical about it and to minimize its importance. The attainment of a cheerful state of mind may be almost as helpful as removing the trouble itself. The writer has often been impressed with the importance of cheerfulness, content, and hopefulness as a therapeutic measure, as well as the effects of various depressing mental and nervous factors in the causation of lowered resistance. In looking over the histories of 740 cases of tuberculosis treated during the past fifteen years, he finds that 129 show reasons for believing that some form of nervous depression was at least an important causative factor. A large proportion of the earlier histories were carelessly taken and give no evidence at all bearing on the subject. He feels certain that it is much more commonly the cause than these figures indicate.

The great mistake and cruel injustice of sending people ill with tuberculosis far from home without sufficient financial resources to enable them to live under proper conditions and for a sufficient time without worry and embarrassment, has often been noted. But those who practice in health resorts still see so much distress from this cause that it cannot be overemphasized. Getting well of tuberculosis is a long process, and the cost of living and of care suitable to the patient's needs is usually greater in a health resort than in one's own home. A better climate will rarely overbalance lack of proper living conditions or worry and anxiety in obtaining them. Moreover, distinct harm is likely to come from advising a plan which the patient is financially unable to carry out.

The prolonged physical and mental rest and the limitations necessarily imposed during a "cure" sometimes become so irksome as to be a real detriment to the patient. In such cases finding out and making available suitable diversion and mental occupation may be the means of changing failure into success. The prescription must be suited to the individual, else harm rather than good may be done.

All these considerations help to show the need of personally taking the histories of our patients and getting into close confidence with them, in order that we may know all the factors in their lives which have to do with their powers of resistance.

They should also indicate the danger of giving routine directions based on a physical diagnosis alone and of treating our patients as a class. We need to make a sort of social service diagnosis and to do the kind of work done by social service workers if we would most efficiently help our patients in the personal struggle to get well of tuberculosis.

THE USE OF PITUITRIN IN INEVITABLE AND INCOMPLETE ABORTION.

O'CONNOR in the *Lancet-Clinic* of October 2, 1915, states that in his view the current opinion as to the effect of pituitrin on the pregnant uterus is that it should not be used until the second stage of labor, and that prior to term its effect on uterine musculature is negative. Whether this product in any dosage could bring on either an abortion or premature birth the writer is unable to say, but that it will assist natures' efforts to empty the uterus at any stage of pregnancy, once the process is fairly under way, can be readily demonstrated by any one. The more advanced the pregnancy the more distinct and palpable the uterine contractions will be, but even during the early weeks of gestation when abortion is threatened every evident manifestation will practically invariably follow its administration, viz., an increase of pains and the passage of clots and intrauterine contents. A brief summary of the cases in which O'Connor has employed this drug during the past year would, he believes, sufficiently convince any reader that its routine use in such cases is not only justifiable but indicated.

Any one familiar with the administration of pituitrin in labor is cognizant of certain after-effects beyond those so useful and valuable on the uterine musculature. The labor is shortened. Twilight anesthesia is safer than morphine and hyoscine anesthesia. The afterbirth is passed promptly; the patient voids readily within a few hours, owing to a diuretic action and the increased tonicity of the bladder musculature; the bowels usually move without a purgative; and the patient often remarks, in comparison to previous experiences, of a general feeling of well-being. Exhaustion and many of the disagreeable after-effects of a tedious and prolonged labor are usually noticeable by their absence. As it largely obviates the necessity for forceps the condition of both the new-born and the mother is unquestionably improved, both as to comfort, safety, and satisfaction. That this same drug will soothe the sufferings and render less dangerous and safer the treatment of the numerous accidents with which an untimely interruption of pregnancy is so frequently complicated will, the author believes, be soon almost universally acknowledged.

The author is fully aware of the fact that up to the present but little has been written on the subject, but he believes that this is due to early reports of negative results. Watson, in the *Journal of the Canadian Medical Association,* states that in the induction of abortion or premature labor, or in the treatment of that already in progress, its effects are uncertain, but may be good if sufficient dosage is given. He also states that it is a marked synergist to ergot and heightens its effect distinctly. Hofstatter, in Germany, also voiced a similar opinion in 1913, but remarks in another part of his paper that the lack of results may have been due to insufficient dosage or deficient standardization. These reports antedate the period of both reliable methods of standardization and the marketing of this drug in ampoules, which lessens its deterioration, and hence cannot be accepted as final. The addition of pituitrin to ergot plus the non-interference treatment, suggested by Winter and corroborated by Benthir, will unquestionably reduce both the morbidity and mortality of abortions in the future.

In all probability but few women have met death as a result of the bleeding attending an abortion, but many have unquestionably been temporarily at least invalided as a result thereof. With the subject of infection the author is cognizant of both an added morbidity as well as mortality. Puerperal infections to-day are compara-

tively rare, but such, unfortunately, is not the case in abortions. The principal reason thereof is that the cases require similar measures of management, and the profession, as a whole, is not sufficiently versed in this lesson. Operative or surgical measures of treatment in cases of incomplete abortions are to-day being recognized as both unnecessary and fraught with danger, especially when infection is present. There are, of course, certain indications for surgical interference, such as uterine perforation with peritonitis, distinct abscess formation, etc., but medical, mechanical, and biological agents are steadily preventing the necessity of surgery.

It is not compatible with the scope of this paper to discuss in detail the various features of postpartum or abortion infections or their treatment, except to state that the lack of aseptic precautions in the criminal induction of abortions, the aseptic carelessness of the physician with his too frequent vaginal examinations or instrumentations and the use of douches, are the usual causes of almost all of the infections, and are the things to be religiously avoided. It must be realized that infection is not only more frequent in abortions than labor at term, but that in many cases it is due to the physician's lack of foresight. Many of the examinations are unnecessary, and unless distinctly indicated it is always best for a patient that the physician make external examinations only. It must be realized also with Winter and Benthir that medical rather than surgical measures will result in a decidedly lessened morbidity and mortality.

It seems but reasonable that the following lines of treatment in O'Connor's opinion should be the standard for cases of inevitable and incomplete abortions:

1. Avoid every possible vaginal examination. Never resort to any kind of vaginal or intrauterine treatment, and under no circumstances permit the use of a douche.

2. Instruct attendants to keep everything that is passed until it can be inspected. Remember that cramp-like pain indicates an unemptied uterus, and that one Cc. of pituitrin administered hypodermically every three hours, if necessary, in combination with a reliable preparation of ergot by mouth, will aid nature in removing the retained products and preventing complications.

3. Patients should be kept in bed for at least ten days, but should be instructed to get out and use a commode for evacuation from both bowel and bladder. If there is any evidence whatsoever of infection the patient should be kept in the Fowler, or semisitting, posture day and night until all danger is past. Hot, moist bichloride packs to the vulva and heat to the lower abdomen are advantageous, especially during the first three days of normal cases and continuously during infections. Appropriate sera or vaccines, stock and autogenous, may be used in treating infections, and surgery should be utilized only when the indications are practically absolute and distinct.

EXERCISE IN THE TREATMENT OF SEVERE DIABETES.

ALLEN in the *Boston Medical and Surgical Journal* of November 11, 1915, says that it seems advantageous to give exercise especially after a meal containing carbohydrate or other food tending to produce glycosuria, although, when patients are able, they exercise at all times of the day. Short periods of vigorous exercise with rests between are preferred to long, slow walks, which might tire the patient even more. The exercises now suggested are running up and down stairs, jumping rope, throwing a heavy "medicine ball," and turning somersaults. Tennis and other hard games should probably be beneficial. At first, precautions may be taken against the nervousness and sleeplessness sometimes caused by overweariness in weak patients. Otherwise, patients are worked right up to the limit of their strength, somewhat like athletes in training. In regard to the reduction in weight which has been advised in the fasting treatment, the question has arisen as to what kind of tissue it is de-

sired to reduce. The answer seems to be that it is desirable to reduce fat and reserve tissues, and build up active muscular tissue. With this end in view, the emaciated, flabby-muscled diabetic is turned into an athlete as far as practicable. During exercise no attempt is made to shield the patient against excitement, invigorating cold, or any similar influences previously dreaded in diabetes. It is hoped that an end may be put to the pale, feeble diabetics, dressed in double underwear while hugging the radiator, and growing more neurasthenic all the time. Some of the exercises above mentioned are planned to shake up these patients and break up their former bad habits, both physically and psychically. The patients feel much better; they are kept occupied during the day, and sleep well at night. Hunger may be partly satisfied by vegetables and bran cakes, but in general exercise has increased appetite less than it has increased the power to satisfy appetite. The patients can take a somewhat more liberal diet, and enjoy the possession of somewhat greater weight and strength; but the increase of weight in this instance consists of muscle, not fat.

It is hoped that this addition to the treatment of severe diabetes will prove of especial value to children, to patients with persistently low tolerance, and perhaps to some of that class previously so hopeless, viz., tuberculous diabetics. For the ordinary type of patients it may be a means of getting results somewhat more quickly and thoroughly, and leading to a higher degree of both comfort and usefulness. The value of exercise is strictly limited. It cannot raise tolerance very high, and it is not equal to the dietary regimen in importance. Results will be unfortunate if it is used merely as a means for shortening the hospital care of the patient, or for building up weight and strength at the cost of more important considerations. The radical and permanent control of the diabetes is the essential matter, and is to be judged by such things as *glycosuria*, acidosis, and blood-sugar, not by a temporary sense of well-being. A stern programme of fasting, low diet, and reduction of weight is still necessary as before, but it is hoped that results may be more beneficial with the use of exercise as an additional detail of the treatment.

THE USE OF WHOLE MILK IN THE ARTIFICIAL FEEDING OF INFANTS.

The Practitioner for November, 1915, contains an article by VINING in which he states that the milk must be citrated in the proportion of two grains of sodium citrate to each ounce of milk. Toward the age of six months the amount may be reduced to half that quantity. Some observers only use one grain from the start, and the writer is not sure that it does not do just as well. The citrate may be ordered in solution, containing a little chloroform water as a preservative, of such a concentration that each teaspoonful of the solution contains sufficient citrate to deal with, say, half a pint of milk.

How much milk should a baby be given? There appear to be three ways of answering this question. The first is a mathematical one. By considering the relationship of the size of the baby to the condition of its environment, we arrive at the amount of heat being lost, and by calculating the food requirements in calories of heat we can gauge the amount of milk necessary to the half-ounce.

The second method consists in giving the child as much as the weekly exchequer will allow. As long as the volume of food is sufficient to fill the child's stomach, its qualitative value is of minor importance. One of the commonest causes of crying and wakefulness in babies is not wind colic and indigestion, but starvation. When a helpless baby is being given, at one month old, two ounces of a mixture containing five drachms of milk and eleven of barley water, it is suffering from flatulent starvation; and after nine months of such feeding, whole milk only being given toward the end, it can be likened to a melon, large and succulent, but containing little of value.

The third method—and in the writer's opinion the only one worth following—con-

sists in first providing a food which contains all that is necessary for the growing child, and can be digested by the average baby, and then allowing the child to indicate the amount it really does require, by those indications of progress that nature has provided, namely, the condition of the stools, the amount of sleep, its weight, and its physical and mental development. Some babies will take more at one feed than another, and most expect and want more after the bath and on waking in the morning than toward the end of the day. A winter baby wants more than a summer one, but the latter requires more liquid, which can be given as drinks of water between the feeds. To allow a child three ounces of food, when it could do with four, means fretfulness and crying until the next feed. We want less humanizing of the food and more of the feeding.

The question still has to be answered as to when exactly whole milk can be started. This question should rarely arise at the start, seeing that the mother should be prevailed upon to feed the child at any rate for as long as she possibly can. If the child has reached the end of the first three weeks or a month and an alternative has to be resorted to, whole milk can be given at once. If the feeding has to be resorted to from birth, the writer, personally, dilutes half-and-half at the start, and increases as rapidly as possible to whole milk; it rarely happens that one is unable to have the baby on whole milk by the end of three weeks or a month. Usually, whole milk can be given within a few days. In the case of most mothers, it is a week or ten days before the true milk is available, so dilution up to that time is quite reasonable. The special difficulty that must at all costs be avoided is constipation. What suits one baby will not always suit another, but as a general rule liquid paraffin or equal parts of the confections of sulphur and senna appear to be most useful.

No originality is claimed for citrated whole milk feeding. The method has been before the profession for ten years, but up to the present it has not taken to it in a way that one would expect, seeing the amount of reliable evidence before it. The chief reason is probably the honest prejudice that still exists, the casein bogy being the cause of most of the trouble. It requires a good deal of courage for a young practitioner to order whole milk when the mother, nurse, relations, friends, and neighbors are totally averse to it, and until this prejudice is broken down the feeding difficulty will continue to exist. Whole-milk feeding has never been put forward as a method of feeding which will prove successful in every case, and certainly never in preference to breast feeding, but it is recommended as the method of choice when breast feeding is out of the question, and the experience of many goes to show that a baby who will not take whole citrated milk will not take cow's milk in any reasonable dilution. Such babies certainly do exist, and when they are found some other method has to be tried.

ACUTE APPENDICITIS IN CHILDREN.

Writing in the *American Journal of Obstetrics* for November, 1915, AYNESWORTH reminds us that in the great majority of all cases of appendicitis in children some form of family medicine has been given before the physician has been summoned, and unless the physician is very alert and the case an outspoken one, all will have had a laxative and many a drastic cathartic. This is due to two things, namely, the great frequency of acute infections and gastrointestinal ailments in which this form of medication is the correct line of procedure, and the great similarity of the early symptoms of appendicitis to the above diseases. The relative sudden occurrence of appendicitis contributes to an occasional oversight by the physician. Laxatives are distinctly contraindicated and should never be given; even when appendicitis is only suspected, time should be taken in which to clear up the diagnosis before resorting to laxatives. Developments in physiology during the last few years have made clear the harmfulness of laxatives in appendicitis. It has been demonstrated that the normal peristalsis in

the cecum and as far as the middle of the transverse colon is toward the appendix until all food products are prepared for entrance into the stage of hard feces. In the cecum the water is absorbed and the remaining food undigested is finally disposed of, excepting very small quantities which are taken up in the distant parts of the colon.

The peristalsis toward the cecum is rather violent and continues until the ascending colon is empty. Laxatives send food products along the intestinal tract and keep the cecum and ascending colon full and tense, which develop waves of antiperistalsis. The musculature of the appendix is a continuation of that of the cecum, and any movement originated in the cecum is transmitted to the appendix. This recurring activity of the cecum with the violent writhing of the appendix during these waves will tend to invite rupture and to spread inflammation, and it will, in addition to the damming up of material in the appendix itself, especially in children, as the cecal end is usually quite wide and often funnel-shaped, increase intra-appendiceal tension with its attendant dangers.

If nausea and vomiting are present and continue, which occur only after peritonitis has supervened, gastric lavage is invaluable. With great pain and tenderness ice applications will often relieve, but if this fails heat may do better in some patients. An enema in order to relieve the colon may be given provided it is a small one and no pressure is used, as otherwise antiperistalsis may be started with all of its evils. Constipation does not have all the evils which the family physician may attribute to it; the effort to overcome constipation in acute appendicitis has sent thousands to an unnecessary grave. The temperature is rarely of sufficient height as to require attention. In reality, there is no medical treatment for appendicitis in a child any more than there is in the adult, but many cases have to be watched until the diagnosis can be made. Then there are cases which, for various reasons, will not submit to surgical measures, and therefore must have medical treatment during the entire time. It is for these patients that there is a medical treatment.

When the diagnosis has been made it is proper to relieve pain by appropriate doses of some opiate if other measures fail, and not before. The writer knows how widely surgeons differ about the use of this one drug in appendicitis, but he has no hesitancy in relieving pain with morphine after the diagnosis has been made and operation refused. If operation is permitted no time is lost in getting this done; but if it is refused, unrelieved pain will do infinitely greater harm than opiates used with discretion in case other measures have failed to make the patient comfortable. In fact, he is not sure but that the constipating effect of opium producing intestinal calm is not beneficial in those who will not submit to operation.

Apparently the Fowler position has lost vogue recently, as have many other doctrines founded upon mistaken physiological ideas; however, it might be well to elevate the head of the bed. "Rectal drips" are not always well borne by children, but when taken kindly they are apparently valuable. No water or food should be given to these patients except in rare instances. Often in young children the "drips" are badly borne; water in small quantities frequently will allay their craving and do less harm than if they were permitted to beg for it. Gastric lavage does not have the place in the treatment of peritonitis in children that it has in adults.

Every child with acute appendicitis should be operated upon if seen early; this means before the inflammation has spread beyond the appendix, and has rather loose reference to the number of hours after the attack has begun. The "hour period" has done great harm, for pathology does not heed time in its processes. Some cases are hopeless within a few hours; others have recurrent attacks for years and finally get well. Often patients are taken to the surgeon with great distention and rapid pulse, spreading tenderness and general muscle rigidity, with more or less cyanosis, rapid

respiration, and all the evidences of septic absorption. To operate upon such a case is to invite disaster; many more will get well by the treatment outlined under medical measures. Between these two extremes are often met patients with localized processes with every evidence of an abscess or at least of local peritonitis without spreading. These should be operated upon only when the general body resistance is good; if an abscess is walled off it is safe and easy to drain and to get the appendix if readily accessible, but if the appendix is difficult to locate, or if it forms a wall of an abscess, it is best to leave it and to take it out later after the antibodies have fortified the patient against infection. It is surprising how well the patients withstand secondary removal of the appendix even though pus is still in the wound. The cardinal principles of abdominal surgery in children are a short operation, a small amount of handling of tissues, and drainage when infection is present.

MORPHINE AND SCOPOLAMINE ACTION UPON THE INTACT UTERUS.

The *Journal of Pharmacology and Experimental Therapeutics* for November, 1915, contains an article by BARBOUR in which he reaches these conclusions:

1. The contractions of the uterus in living animals can be recorded conveniently by the method described in this paper. The organ is suspended in a glass cylinder made continuous with the peritoneal cavity. The whole is filled with warm oil kept gently circulating by the movements of the diaphragm.

2. Neither morphine nor scopolamine causes profound changes in the activity of the pregnant or non-pregnant uterus of decerebrate cats. A temporary increase in tone such as described for the isolated organ is often seen in the case of both drugs. Morphine in decerebrate cats may cause indirectly a relaxation of the uterus if a marked depression of the circulation be produced.

3. Morphine (0.02 gramme) increases the tone of the uterus of rabbits under paraldehyde.

4. Doses up to 0.02 gramme each of morphine and scopolamine given together possess little or no action upon the uterus.

5. The statement that large doses of these narcotics inhibit the activity of the uterus is not applicable to any direct action of morphine or scopolamine upon this organ. The delay in labor produced by either or both of these drugs is probably due entirely to their cerebral action.

THE RESPONSE OF THE SURVIVING UTERUS TO MORPHINE AND SCOPOLAMINE.

In the *Journal of Pharmacology and Experimental Therapeutics* for November, 1915, BARBOUR and COPENHAVER state that the wide employment of morphine and scopolamine in obstetrics suggests the desirability of more accurate knowledge of the action of these drugs upon the uterus. Therefore, studies have been undertaken upon the response to morphine and scopolamine, given separately as well as together, on both the surviving and the living uterus of mammals. The combined action is of further interest because of the numerous experiments of Bürgi, Kochmann, and others, which indicate that morphine and scopolamine in their action upon the central nervous system exhibit a true synergism.

The following are the results of experiments on surviving pregnant and non-pregnant uteri of guinea-pigs and cats:

1. Morphine, in concentrations of from 0.05 to 0.1 per cent, and sometimes as low as 0.002 per cent, stimulates the isolated uterus to an increase in tone.

2. Scopolamine, in concentrations of 0.005 to 0.06 per cent, and sometimes as low as 0.001 per cent, increases the tone of the isolated uterus. In this respect, therefore, it appears to be about ten times as powerful as morphine.

3. The inhibitory action upon the tone of the uterus described by Kehrer for large doses could be obtained with neither of the above substances. Very high concentra-

tions of either tend to produce a tetanic condition of the organ.

4. No synergism or antagonism could be demonstrated in the direct action of these drugs upon the uterus.

THE REMOVAL OF SUPERFLUOUS HAIR BY ELECTROLYSIS.

BATHURST in *The Practitioner* for November, 1915, states that the strength of current applied should be from .75-1.5 or 2 milliamperes, 1 milliampere being generally quite sufficient. If the pantostat be used, it may be set by experiment for each individual case, and will remain nearly constant, requiring only slight adjustment as resistance is overcome, throughout the sitting.

Of the greatest importance is a good light, and if daylight is not good a headlamp, which may also be worked from the pantostat, combined with Zeiss's binocular magnifiers, gives great assistance. The writer has derived no help from ordinary lenses held in the hand.

The patient is placed on a couch with the head well back, the operator standing at the head of the couch with the pantostat on his left, if he uses the right hand for the needle-holder, so that he may be able to regulate the current if necessary with the left hand. The needle should be sterilized in a spirit flame before each insertion.

The needle is usually connected with the negative pole, and the indifferent electrode to the positive. The result of this is that hydrogen is liberated wherever the needle is in contact with the tissues, together with the alkalies, sodium, and potassium, which effect the destruction of the papilla. The success of the operation on each individual hair depends upon the introduction of the needle into the hair follicle, so that the point may reach and destroy the papilla. This may be effected with a current of 1 milliampere in 5 to 20 seconds, and one may fairly assume success when after such treatment the hair is found to come easily out of the follicle, as if it had merely been lying in it with no attachment.

If the hair needs any force for removal, it should be assumed that the papilla has not been destroyed, and the operation should be repeated.

At a sitting from 20 to 50 hairs may be removed, but care should be taken not to attack too many in any given area on account of the danger of inflammation being set up. A skilful operator may count on permanent destruction of 60 to 80 per cent of the hairs treated.

A difficulty which is sure to be encountered at first, and which may be met with at any time, is that connected with the introduction of the needle. Fair hair of a fine silky quality on a fair skin presents difficulties of vision, which a good light and suitable lenses may do much to overcome.

There are also anatomical difficulties:

The neck of the hair follicle may be constricted so closely as to offer great obstruction to the entry of the needle.

The direction of the hair follicle beneath the skin may be different to that expected, and the hair as seen is not always a guide to that direction.

The needle may inadvertently be directed into the duct of a sebaceous gland instead of along the hair sheath.

A difficulty frequently met with is the heaping up of epithelial cells round the follicular opening and in close contact with the hair itself. Practice and experience alone can help to overcome these difficulties.

The immediate result of the electrolysis which is noticeable is the bubbling froth round the needle at the mouth of the follicle caused by the liberation of hydrogen. This is greater in proportion to the moisture round the hair. Hyperemia of the skin is observed as the result of the electrical stimulation, varying in degree in different individuals. This hyperemia passes off in the course of an hour or so.

The number of sittings necessary and their frequency vary in different cases. One or two sittings a week may be given at first, and their frequency gradually diminished. The work, necessitating as it does the closest attention and care, should never be undertaken in a hurry or under

any but favorable conditions, but only when time and circumstances permit of the strictest attention to detail.

While any obvious scarring is evidence of bad workmanship, it should be recognized, and explained beforehand to the patient, that where a large number of hairs have to be treated on a small area of skin, some alteration of the general texture of the skin is unavoidable.

THE PRESENT STATUS OF TWILIGHT SLEEP IN OBSTETRICS, BASED ON A COLLECTION STUDY OF OVER 2000 CASES.

In the *American Journal of Obstetrics* for November, 1915, RONGY states that a summary of the results of the various investigators, as well as his own experience, brings forth the following conclusions:

1. That if the method was practiced according to technique of Gauss in fully 90 per cent of the cases, the results were uniformly favorable to both mother and child. Complications and untoward effects took place in those cases only in which the dosage, as directed by Gauss, was not strictly adhered to.

2. The standard (stable) preparation of scopolamine was, at first, used but little. Open-market preparations of hyoscine were employed, and this, in all probability, accounts for a great number of patients who suffered from marked restlessness. With the introduction of the stable (Straub) preparation of scopolamine, this factor has been greatly diminished.

3. Morphine, or narcophen, was not repeated except in extreme cases of restlessness.

4. Nearly all agree that the treatment should not be instituted until there are definite signs of active labor.

5. It is interesting to note that fully 90 per cent of the patients were treated in a special room assigned for this purpose.

6. Seventy-five or eighty per cent of all cases treated were primiparæ. The average duration of treatment in primiparæ was seven hours, in multiparæ four hours. The average number of injections in primiparæ was five and one-half, in multiparæ three.

7. In about 60 per cent of cases the first stage was apparently shortened. All are unanimously agreed that the second stage is definitely prolonged. The third stage does not seem to be influenced.

8. Ten per cent of the cases showed various degrees of restlessness requiring restraint.

9. Four cases showed signs af active delirium during the postpartum period, but all recovered in a comparatively short time.

10. Treatment was discontinued in four per cent of cases for the following reasons: (*a*) Too early administration of the drugs; (*b*) disproportion between fetal head and pelvis; (*c*) cessation of labor pains; (*d*) marked alterations in the fetal heart sounds; (*e*) repeated injections without any apparent effect.

11. There was no maternal mortality which could possibly be ascribed to this treatment.

12. Labor was terminated in primiparæ by the use of forceps in 26 per cent of these cases. However, fully 80 per cent of these were low forceps, which merely required lifting the head over the perineum.

13. A general anesthetic was used during the stage of expulsion; and in most instances chloroform was the anesthetic of choice. Ethyl chloride, ether, and somnoform were also used.

14. Seventy-eight per cent of babies cried spontaneously; 16 per cent were born oligopneic and required active resuscitation; 3 per cent were born asphyxiated; 3 per cent were stillborn—12 of these, or 1.2 per cent, may be accounted for by well-recognized pathological findings, such as transposition of the viscera (two cases); monstrosities (two cases); macerated fetus, cerebral hemorrhage (autopsy), etc.

Of the remaining 18 cases, or 1.8 per cent, the writer is aware of a number of instances in which large doses of either scopolamine or morphine, or both, were given.

15. The treatment is contraindicated in: (*a*) primary inertia; (*b*) labor associated with hemorrhage; (*c*) feeble fetal heart

sounds; (*d*) multiparæ giving history of short labors.

"Twilight sleep" has its greatest usefulness in primiparæ, particularly during the first stage of labor where the dilatation is progressing slowly.

16. It is the consensus of opinion that amnesia, with varying degrees of analgesia, should be our aim. However, the majority consider that the successful termination of a case depends, primarily, upon the degree of amnesia induced.

17. Most investigators are of the opinion that "twilight sleep," in properly selected cases, will become a permanent addition to our obstetric armamentarium. We must, however, realize that the great enthusiasm which was created by the introduction of this treatment may in a measure account for the high percentage of successes. In addition, we must bear in mind that this treatment was carried out by men best fitted for this work under the most favorable hospital surroundings, and it is but natural to expect results that under ordinary circumstances could not have been attained. What the results would be if this treatment were administered in the average home, by men not especially trained in the practice of obstetrics, may be judged by the isolated reports coming from such sources.

It is, therefore, the writer's belief that it would be unwise to adopt this form of treatment to be universal, because the greatest number of women are still confined at their homes, either by midwives or by physicians who have not the time nor the training to practice such a delicate therapeutic measure. However, this should not detract from its value. An analysis of the various reports shows that most investigators are fully agreed that "twilight sleep" is devoid of any danger to the mother, and that by constant and careful watching the dangers to the baby are also eliminated.

Judging from the writer's personal experience, extending over a period of fifteen months, and covering a series of over 350 cases, he feels that the value of this treatment, and its acceptance as a recognized therapeutic measure, will depend upon our interpretation of the physiological phenomena produced by these drugs. If we accept the theory that the semiconsciousness, induced by Gauss' method, prevents the actual perception of pain, although apparently present in all its clinical phases, then labor must be considered painless. Therefore, to refuse to adopt this treatment would be a failure on our part to abide by the trust reposed in us. On the other hand, if the mental state induced does not actually prevent the sensation of pain and the patient is actually suffering, even though pain be modified, then the value will devolve upon the degree of diminution of pain or analgesia, and not upon the want of recollection of pain or amnesia.

Personally, the writer finds it difficult to reconcile the fact that a patient, displaying all clinical evidences of pain, such as crying and groaning, does not actually experience it. However, he is fully convinced that pain, in many cases, is not well tolerated, and that this would warrant the adoption of this method in selected cases; more especially in primiparæ of the highly emotional type, and in multiparæ in whom we anticipate a long and tedious labor.

THE PITUITARY GLAND IN DIABETES MELLITUS AND OTHER ENDOCRINE DISORDERS.

The *Medical Record* of November 13, 1915, well says that diabetes is nowadays regarded generally as a disorder of multiple etiology. It is a variable symptom-complex dependent upon disease of one or more of the organs of internal secretion. This conception has been based partly on clinical observation and partly on experimental investigation. Until recently the pancreas was the chief center of interest in the study of the problem of diabetes, but latterly attention has been shifted mainly to the pituitary gland. That the posterior lobe of this organ plays an important part in carbohydrate metabolism has been demonstrated by Goetsch, Cushing, and Jacobson; while the last two observers, in conjunction with Weed, have shown that electrical stimula-

tion of the pituitary gland causes glycosuria, even when this organ is severed from all nervous connection with the abdominal organs.

The next point of attack has been the study of the histological changes occurring in the pituitary gland in diabetes and in other disorders of the organs of internal secretion. This investigation has been carried out by H. J. B. Fry (*Quarterly Journal of Medicine*, July, 1915). The post-mortem material available for this research comprised eight cases of diabetes mellitus in which disease of the pancreas was also demonstrated, three cases of acute pancreatitis, one case of carcinoma of the pancreas, two cases of myxedema, one case of cystic goitre, one case of Addison's disease, and two cases of hypertrophied thymus. The most important result of this study was the demonstration of definite histological changes in the anterior lobe of the pituitary body in cases of diabetes. These changes consist in the presence of adenomatous masses of eosinophile cells, colloid invasion of the anterior lobe, and areas of cellular degeneration. In cases of acute pancreatitis and carcinoma of the pancreas histological changes in the pituitary are absent or slight. In myxedema there occurs in the pituitary an increase in weight resulting from an increase in the connective-tissue elements and a hyperplasia of the chief cells. In goitre there is a hyperplasia of the chromophile cells, especially of the eosinophilic cells, and an increase of colloid material in the interglandular cleft. No histological changes were observed in the pituitary gland in the case of Addison's disease or in the case of status thymolymphaticus.

Fry presents a tentative explanation of the activity and mode of secretion of the pituitary gland. He states that the eosinophilic and basophilic cells are derived from the chief cells by the formation of zymogen granules. The granular cells represent a stage of active secretion, and glandular activity is greater toward the center and posterior border of the anterior lobe. From the granules is formed the colloid which is temporarily stored in the interglandular cleft, and thence passes into the posterior lobe and infundibulum and gains access to the cerebrospinal fluid. The hyaline and granular bodies are derived from cells of the anterior lobe which have been carried into the substance of the posterior lobe in the process of development. It is upon these cells that the call for increased secretory activity first falls. Colloid in the interglandular cleft is then utilized, and if there is an overdemand upon the secretory activity of the anterior lobe, colloid may invade the posterior part of the latter and the cells themselves become rapidly converted into colloid, until finally areas of atrophy of the cells appear. The question is still undecided whether the posterior lobe activates the colloid in its passage, or adds some specific secretion of its own, or acts merely as an indifferent supporting structure.

URINE FORMATION BY THE PERFUSED KIDNEY.

RICHARDS and PLANT in the *Journal of Pharmacology and Experimental Therapeutics* for November, 1915, reach the following conclusions from a research along these lines:

1. They describe a method for perfusing the rabbit's kidney *in situ* with hirudinized blood under conditions which permit adjustment and measurement of blood-flow through the kidney.

2. When blood-flow through the perfused kidney amounts to 28 to 30 Cc. per minute, fluid is eliminated from the ureter which is comparable in composition with that secreted before perfusion was begun.

3. Rate of urine secretion by the perfused kidney is relatively constant when blood-flow through the kidney is constant: it appears to be independent of changes of pressure in the renal circulation, provided (as in these experiments) changes in pressure do not cause changes in volume of blood flowing through it.

4. Caffeine causes diuresis in the perfused kidney when the rate of blood-flow through the kidney remains constant. The

increase in blood-flow which occurs in the intact animal as the result of the action of caffeine upon the renal vessels is therefore not an essential factor in caffeine diuresis.

5. It is questionable whether 0.9 per cent sodium chloride (5-6 Cc. per kilo) is capable of causing diuresis when blood-flow through the kidney is constant: the same amount of sodium chloride, given as a 5-per-cent solution, is diuretic, even when the rate of kidney perfusion does not change.

6. Phlorizin causes both diuresis and glycosuria in the perfused kidney.

THE MANAGEMENT OF ENURESIS.

In the *Archives of Pediatrics* for October, 1915, NEWLIN well says that the treatment of enuresis, while rather a fertile field for literary effort, chiefly consists at the hands of most practitioners in the administration of belladonna and atropine. While these drugs are almost universally employed there is a long list of medicaments that have been exploited by diverse authors. Atropine, belladonna, strychnine, salol, boric acid, hexamethylenamine, ergot, citrate of potash, bromides, organotherapy, etc., have all been recommended. Occasionally other methods of treatment have been practiced, as the use of faradism, the interruption of the flow during the act of micturition, and so forth. The use of drugs by the writer has been mainly limited to atropine and belladonna; thyroid extract was tried in a small series of cases (6), but did not meet with the results claimed for it, although almost always there was a temporary improvement following its administration. In one case especially did the use of thyroid extract give promise of extraordinary results; this was in a choreic child of thirteen, who had always wet the bed at least once during the night, and who for the first week of treatment stopped the habit entirely. She soon relapsed, however, the thyroid apparently having no effect upon her whatever. The method outlined below of course does not apply to those cases in which some organic basis is found for the incontinence, and is only applicable when, after examination, the conclusion is reached that the condition is due to a neurosis.

The method of management of enuresis, whether it be diurnal or nocturnal, or both, that has given the best results in the experience of the writer consists in the simple procedure of anticipating the involuntary act by a voluntary emptying of the bladder. This, it is granted, is the usual accompaniment of any treatment, but when carried out systematically can preclude the use of drugs absolutely; it gives far better results than when the chief reliance is placed upon medicines, with only perfunctory instructions as to the actual management of the child itself. This method of handling even obstinate cases of enuresis, although it embodies nothing original, is rarely carried out systematically, but when it is so conducted gives almost invariably successful results. The chief obstacle encountered is the difficulty of impressing on the mother or nurse the fact that unless the instructions are absolutely faithfully followed the result is failure.

To the child's attendant is first explained the rationale of the method, and she is made to understand that eternal vigilance is the price of safety; if she hopes to be successful she must devote herself exclusively to the child day and night for the first three or four days. It rarely happens that after the third or fourth day there is need of exhaustive attention. The nurse is given a sheet of paper with the hours of the day and night placed in a vertical row at the left-hand margin under the heading of the day of the week. If the enuresis occurs, say, on an average of every two hours, she is instructed to put the child on the chamber every hour for the first twelve hours. If she finds the clothing wet at any such time the hour is noted on the chart. At night the child is lifted almost as frequently during the early hours—that is, up to eleven o'clock or midnight; after that every second hour is usually all that is necessary for the first night. At the end of the first twenty-four hours she then either has a clear chart or one with several hours marked as indicating the time of the enuresis. On the

second day she is guided by her chart of the previous day, and she may extend the length of time between the voluntary urinations, always, however, anticipating the hours marked as "Wet" on the day before, placing the child on the chamber at least a half-hour before the time indicated. Thus in each succeeding day the intervals are longer; the hours of voluntary urination may be recorded in the vertical column under the date, the act of enuresis being always marked at the hour at which it occurred. If enuresis does occur the intervals on the succeeding day are shortened at about the hours that it was noted. If the case is a diurnal one, the method is easy; if nocturnal, the first two nights are troublesome, but subsequently almost always the intervals can be lengthened so that there is little discomfort to either parent or child. It usually happens that in moderately bad cases from the time the régime is started enurèsis ceases entirely, and by the end of a week, in at least the milder cases, the child will go from eleven o'clock at night to six in the morning without wetting the bed.

THE EFFECT OF CAFFEINE UPON THE BLOOD-FLOW IN NORMAL HUMAN SUBJECTS.

The *Journal of Pharmacology and Experimental Therapeutics* for November, 1915, contains a report of a research by MEANS and NEWBURGH in which they report experiments upon the blood-flow of two normal subjects during rest, and of one subject during muscular work.

The action of caffeine on the blood-flow was studied in both subjects while at rest, and in one during work.

The average blood-flow of the two subjects at rest was 4.5 and 4.0 liters per minute; the systolic outputs were 61 and 57 Cc.; the coefficients of utilization of the oxygen-carrying capacity of the blood were 31 per cent and 41 per cent.

With increasing work a steady rise in blood-flow, oxygen absorption, and pulmonary ventilation was found. The increase in blood-flow was produced first by an increase in systolic output until a maximum of 118 Cc. was reached, beyond that by an increase in pulse-rate. This suggested that the supply of venous blood in this subject becomes "adequate" at about 640 kg. meters of work per minute. The coefficient of utilization showed a slight rise during work, indicating a slightly greater economy of the circulation.

After giving caffeine during rest, or when the supply of venous blood is "inadequate," evidence of drug action was found with both subjects. This action consisted in an increase in total blood-flow without a corresponding increase in oxygen absorption, and hence a decreased coefficient of utilization of the oxygen-carrying capacity of the blood. The pulse-rate was unchanged. Consequently the systolic output was increased.

During work probably no other action was obtained from caffeine than possibly an increase in pulse-rate, and consequently slight diminution in systolic output.

It is suggested that during rest when the supply of blood to the right heart is "inadequate," caffeine increases the blood-flow by increasing the venous supply through an action upon some mechanism outside the heart. When the supply becomes "adequate" or approaches adequacy, no such action is obtained.

ON THE ACTION OF COCAINE.

In the *Journal of Pharmacology and Experimental Therapeutics* for November, 1915, KURODA after studying the physiological effects of cocaine reports as follows:

Cocaine therefore first increases the activity of unstriated muscle and then depresses it, whatever be the nature of the sympathetic control. In some instances the phase of increased activity was not observed.

It is argued that the dilatation of the pupil under cocaine arises from direct action on the muscle of the iris and not from stimulation of the terminations of the sympathetic in the iris.

The action of cocaine in first stimulating

and then paralyzing muscle fiber (including that of the iris) is analogous to its effects on other forms of living matter, including that on sensory organs when directly applied to them.

PUNCTURE OF THE CORPUS CALLOSUM IN EPILEPSY.

STIEDA (*Archiv für klinische Chirurgie*, Bd. 105, Heft 2, 1914) reports the use in his clinic for the last five years in the treatment of idiopathic epilepsy of the puncture of the corpus callosum, as suggested by Anton and first performed by von Bramann in 1908. The object of this procedure is to furnish a channel by which the cerebrospinal fluid may pass from the ventricles to the subdural space. This communication is necessary for the nourishment as well as the proper function of the brain. This operation is especially recommended as it causes but slight operative trauma to the brain, is quickly and relatively easily performed, and may be repeated either on the same or the opposite side as occasion demands.

As a result of this operation, in a case of epilepsy with its origin at the time of puberty, the attacks became milder and for two years were almost absent, and then returned in a mild form; in a case of Jacksonian epilepsy with choked disk both conditions were cured and have remained so for 4½ years past; in a case of genuine epilepsy with imbecility and hydrocephalus internus the spasms stopped for several weeks, then returned with less intensity; in two cases having daily attacks with idiocy they ceased for seven months, while the mental condition improved, but one again suffered occasional attacks; one case in a girl beginning at puberty was uninfluenced; in a case of imbecility with two to three spasms daily they stopped for a month and then returned in milder form; a case of microcephalus with epilepsy showed no change; two cases operated upon six weeks since have shown no return. There has been no fatality from the procedure, nor has there been any demonstrable injurious effect.

PLASTIC DRAINAGE OF ASCITES.

SCHEPELMANN (*Archiv für klinische Chirurgie*, Bd. 106, Heft 4, 1915) according to his method of treating ascites by plastic drainage makes a curved incision, under local anesthesia, obliquely upward and outward on each side of the navel, so that a flap of skin and fat is produced tongue-like in shape, with the point downward. The aponeurosis, muscle, transversalis fascia, and peritoneum are then divided by blunt dissection and the fluid allowed to slowly evacuate itself. The larger end of a piece of calf's aorta is then carried in through the opening so that it extends about one inch inside the peritoneal cavity and the peritoneum sutured around it. The remaining portion of the tube is carried downward so that its outer end lies in the subcutaneous fat layer, and is sutured in place with catgut. The flap is then brought down into place and fastened either with silk or Michel clamps, and the line of closure covered with a collodion dressing. The patient is kept in bed for a day and then allowed to be up, and in four or five days discharged from the hospital.

The pieces of aorta are prepared by collecting them under aseptic precautions from calves at the time of slaughter and removing almost all the surrounding connective tissue. A glass rod is passed into the lumen to preserve it, and the pieces of aorta put into a 10-per-cent solution of formol which is changed daily. At the end of two days the glass rod is removed, as the aorta is sufficiently stiff to maintain its shape, and, after four to six days, the preparation is complete and the tissues stored away to be used weeks or months later. When about to be used several of the aortæ are transferred to a normal saline solution, which is renewed daily for several days to remove the last trace of formol.

This method has been used on four cases. In the first case the result was good at first, but later the ascites returned and autopsy showed that the tube had been compressed and obliterated. This was obviated in later cases by the above-mentioned method of preparation of the aortæ. In the second

case the result was good at the beginning, and death which occurred later was due to the cachexia which had developed at the time of operation. In the third case due to heart disease the relief was marked. Puncture which it had been necessary to perform every few weeks was no longer required. Death which later supervened was due to the heart affection. In the fourth case, which is still under observation, the result has been favorable.

The operation is indicated only in cases in which there is interference with the passage of blood from the vena porta to the vena cava. This is chiefly the case in cirrhosis, but is also true in congestion, liver syphilis, and tumors around the portal veins. It is contraindicated in all forms of inflammation.

END RESULTS OF A SERIES OF THREE HUNDRED OPERATIONS ON THE GALL-BLADDER.

BUCHANAN (*Surgery, Gynecology and Obstetrics,* October, 1915) notes that at the Mayo clinic during the year 1914 of 849 cases of operation on the gall-bladder alone, 708 were excised—83⅓ per cent—and that all of the 140 cases that were drained were cases of acute cholecystitis, with or without stone.

Buchanan quoted W. J. Mayo to the effect that while cholecystotomy may be an efficient procedure in gall-stone diseases when the gall-bladder is otherwise normal and the ducts are free, in cholecystitis the method is not satisfactory, since a gall-bladder which can keep up continuous trouble from infection alone, without the mechanical irritation of gall-stones, will probably not be cured by simple drainage, and cholecystectomy will be the procedure to follow.

Crile says that "No adverse effects from cholecystectomy have been seen, provided the division is made at the beginning of the cystic duct, that no gall-bladder is left, and that the division does not at all encroach on the common duct. . . . If acute infection be present, then, in most cases, cholecystostomy should be first performed, followed, if required, by a later cholecystectomy. If the gall-bladder and the cystic duct be approximately normal, then the gall-bladder should be left. If the gall-bladder be thick, contain much scar-tissue, be shrunken, show chronic infection of the wall; if the cystic duct be partially or completely strictured; or if a stone be impacted in the duct, then cholecystectomy should be performed."

Buchanan believes that the fate of the drained gall-bladder that is not totally gangrenous (and totally gangrenous cases are exceedingly rare) lies in the perviousness of the cystic duct. If it is obstructed by an overlooked stone, or by a pressure-necrosis stricture from a previously impacted stone, then that patient stands a poor chance of a cure by drainage only. He believes that no operator can always know the condition of the cystic duct. If the bile flows freely through it during the operation, the probability is great in stone cases and acute inflammations that the gall-bladder will be restored to its function, whatever that is.

If the bile does not flow and a probe, as is usual, cannot be carried into the common duct, no one can tell whether this is due to a small overlooked stone, an organic stricture, or, what is most common, congestion of the mucous and submucous coats of a tortuous duct.

If any surgeon feels that he must make sure of every case, then he must remove every gall-bladder, and unless he be possessed of rare skill Buchanan believes his immediate mortality from cholecystectomy will far outbalance the morbidity of his uncured cases.

The worst that is likely to happen is that the patient is not cured and that he must be reoperated upon for the removal of a hopelessly crippled organ that is permanently out of commission. This is not pleasant either for the patient or the surgeon; but we must remember that it is not a common occurrence, and becomes more rare as the surgeon's skill increases.

Buchanan in his study of end results has included all those cases in which the gall-bladder alone was involved in the disease, and also those in which the gall-bladder only

seemed to be involved, but subsequent events proved that an overlooked stone existed in the common duct. He has included the cases of acute cholecystitis, with or without stone, comprising 32 per cent of the entire number, taking in the cases of empyema of the gall-bladder, of which there were 55, and the cases of total gangrene, of which there were two. He has also included the chronic cases of cholecystitis without stone and the chronic cases of stone in the gall-bladder whether or not the gall-bladder was evidently diseased. The cases operated on secondarily, the primary operation having been done elsewhere, are omitted, as are also the cases in which stone was found in the common duct at the time of operation. He has reported a case as acute if the gall-bladder presented the usual appearance of acute inflammation, namely, redness and thickening with perhaps sponginess and friability.

He has applied to the quiet cases an equally simple test, such as we are accustomed to apply to the appendix, namely, that they should be considered cases of chronic inflammation only if they were thick, white, fibroid, atrophied, adherent, strictured, or hour-glass. In the chronic cases that require microscopical proof and the strawberry gall-bladder, Buchanan's experience has been too limited to be of any value. Perhaps some of the cases which do not appear in his records as gall-bladder cases at all, in which he has examined the gall-bladder and considered it normal, may really have been of this type and should have been subjected to cholecystectomy.

Of 300 cases all have been traced but 18, giving 94 per cent of known results. The cases that are designated as "satisfactorily cured" are such as appear, by the most careful scrutiny of the information secured, to have been completely relieved of symptoms referable to the bile tract. Those stated in the tables to have had unsatisfactory features in their subsequent history (12 per cent of the total number of cures) are set down in detail in a separate table. The uncured cases also are fully exploited in a table of their own.

The question may properly arise as to why 95 per cent of the cases in this series have been drained and only 5 per cent excised. The answer has a temperamental basis, and the principal reason is a certain conservatism or timidity, if you will, in changing a practice which seemed to be giving fairly good results over a period of years.

Analysis of the 13 uncured cases of chronic gall-stone patients shows that 10 of them would probably have been better off with a primary cholecystectomy; in four of these stones were certainly overlooked; and in six the symptoms pointed to obstruction of the cystic duct either from stone or stricture.

Of the 14 uncured cases of acute gall-stone patients, four had stones subsequently scooped out. In these and in the great majority of the acute cases the local conditions were such that cholecystectomy was not to be considered.

In the gall-stone cases 78 per cent were females; in the cholecystitis cases 66 per cent. Only two patients were under twenty years of age—a girl of five and one-half years with empyema, and a girl of nineteen years with stones and a simultaneous acute appendicitis.

In exactly 100 cases was the previous occurrence or not of typhoid fever noted in the history. In 41 of these typhoid fever had been an antecedent, and in 59 it had not.

No patient was known or suspected to have developed cancer of the bile tract after operation. (Graff and Weinert observed cancerous development subsequent to cholecystectomy in four of their 124 cases.)

While stone was afterward found in ten of his cases—a little more than 3 per cent—there was no good evidence that any of these was a case of true recurrence. Overlooked stone occurs in the practice of all operators in 2 to 5 per cent of cases.

Of the ten cases in which stones were here overlooked, in one the patient cured himself by extruding 50 to 75 stones from his sinus; in one the stone was passed by the bowel; in three cases the stones were

scooped from the gall-bladder after dilatation of the sinus with sponge tents; in one case the stones were removed years after closure by cholecystotomy; in two cases impacted stones were removed by cholecystectomy; in one probably by choledochotomy elsewhere; in one probably the stone remains.

Incision was in most cases through the rectus muscle; in many of the earlier cases Kocher's incision parallel with the costal cartilages was employed, and it did not seem that the muscle section tended to hernia production.

Local anesthesia was used in a small proportion of cases and only in very weak patients. It was invariably well borne and did not prevent necessary manipulations, but, naturally, as little as was necessary was done.

The common duct was palpated in most of the cases and drained in some with expectation of finding stone. (Common-duct stone cases are not considered in this paper.) Negative evidence concerning the contents of the common duct was never very confidently relied on.

Much reliance as to prognosis of cure was placed on the flow of fresh bile on the table and within the next few days. Note of this fact was made in 212 cases, and it was found that when the bile flowed freely from the gall-bladder, only 8.5 per cent were not entirely cured; whereas in the cases in which the bile did not flow at all, 45 per cent were not entirely cured.

The margin of the opening in the gall-bladder in all cases operated in the last ten years was overwhipped with a catgut suture and narrowed with a stitch so as to tightly embrace the rubber drain, making practically a water-tight joint.

This overwhipping renders hemorrhage from the vascular structure impossible. Whenever the fundus could be brought to the peritoneum without tension it was anchored there, and there was no complaint of discomfort to indicate that this was not good practice. Buchanan believes this ancient practice in normal cases reduces the liability to adhesions. Where the fundus will not easily reach the parietal peritoneum the gall-bladder is dropped, with the tube secured as described.

In conclusion he states that cholecystotomy is not a satisfactory operation, giving but 81.7 per cent of ultimate cures, taking the cases as they come.

Cholecystectomy would not be a satisfactory operation if employed in all cases by operators of ordinary skill, and perhaps even by the most skilful surgeons.

The personal equation enters so largely into this question that it must be conceded by the advocates of cholecystectomy as well as the followers of cholecystotomy (if any still exist) that the practice that is safe for one operator is unsafe for another.

As a surgeon's experience increases and as he honestly follows his cases and considers their condition, he is more disposed to turn to cholecystectomy; and at the same time he should realize that the too hasty adoption of this course may be attended with an increase in his mortality list.

There is a field for both operations, and that surgeon will have most success who will not only consider the condition of the patient but estimate justly his own capabilities.

INTRACRANIAL TELANGIECTASIS: SYMPTOMATOLOGY AND TREATMENT.

SACHS (*American Journal of the Medical Sciences*, October, 1915) because operations for Jacksonian epilepsy have so frequently resulted in negative findings, calls attention to a group of cases which yield to treatment. This group, though apparently not large, has nevertheless a characteristic pathological picture. A telangiectasis is a congenital dilatation of capillaries without any new-formed blood-vessels, while an angioma is a new growth and only properly so called when new blood-vessels are formed. In some of these cases the process is connected primarily with the capillaries, in some with the veins, and in others with the arteries. In true angiomata no vessels with all three coats developed are found.

The classification of this process might

seem merely of academic interest, but it has most important bearing on the treatment and prognosis. If this is a true new growth, extirpation is the procedure indicated, while if it is a telangiectasis, ligation should suffice. The question naturally arises, Will these thrombosed vessels, if left *in situ*, irritate the cortex, and should they therefore be removed after ligation? If possible the ligation should be planned so that the vessels do not remain filled with blood, but are collapsed after the ligation. They will then atrophy and do no harm. This condition is a favorable one from an operative and prognostic standpoint.

The first case was a boy ten years old, who three months after a fall suffered from convulsions on the left side of the body and fever. The convulsions began in the leg, and complete left-sided palsy developed, which cleared up in a month. A year later monthly convulsions occurred, beginning in the face. There was a left knee-jerk more active than the right and double Babinski and normal eye grounds. On opening the dura a huge bluish mass of vessels protruded so dense in places that the underlying cortex could not be seen. This mass lay over the motor area. There were no branches connecting with the dural vessels. This operation consisted simply in exposure and closure. A month later an effort was made to remove the angiomatous mass, but the patient died.

The second case, a boy ten years old, had his first convulsion when three months old. There have been five since, three of these in the three months preceding admission to the hospital, unconsciousness lasting from one to two hours. The convulsions began in the wrist of the left hand. There were minor attacks beginning as often as five or six times a day. In these the patient was sleepy and had a numb feeling in his hand. Wassermann was negative. Physical examination showed a weakness of the two lower branches of the left seventh nerve on emotional exertion, and a pale telangiectasis over the forehead. The left eye-ground showed an old choroidal atrophy and the right was normal. On exploratory craniotomy an angiomatous process was found in the dura, which on reflecting the dura was found to have numerous connections with the pial vessels. This area of increased vascularity lay over the lower part of the motor area. All the vessels connecting with the pial vessels were ligated and the dural mass ligated above and below; then the dura was closed. Two days after operation the patient had a violent convulsion. Since then he has been well (six months), but there have been three of the light attacks of which he formerly had five or six daily.

SURGICAL ANATOMY OF CLEFT PALATE.

EASTMAN (*Journal of the American Medical Association*, Sept. 11, 1915) observes that the favorable results in operations for the repair of cleft palate depend much less on the operator's skill and experience than on a clear understanding of certain essential facts of surgical anatomy, the blood supply to the sutured palate being of paramount importance. If the dissection made in the preparation of the flaps is so carried out as to avoid injury to the large palatal vessels, it is a comparatively easy matter to insure an adequate blood supply to the united margins. The blood supply to the hard palate is derived chiefly from the major and minor palatine arteries, which are the two divisions of the descending posterior palatine artery, a branch of the internal maxillary. The larger vessel passes down the posterior palatine canal and emerges from the posterior palatine foramen, which is internal to and behind the last molar tooth in the adult and the last premolar in the infant. It runs forward in a groove on the inner side of the alveolar border of the hard palate to the anterior palatine canal, situated near the midline just behind the incisor teeth, where the terminal branch of the artery passes upward to anastomose with the nasopalatine artery. It sends branches to the mucous membrane of the hard palate and the palatine glands. The smaller division of the descending palatine goes to the soft palate, which also re-

ceives blood from the inferior or ascending palatine of the facial artery and ramifications of one division of the ascending pharyngeal, the smallest branch of the external carotid. It is in the making of lateral incisions that the large trunk passing between the anterior and posterior foramina of the palate, sending its largest branches medialward under the palatine mucosa, is likely to be divided or split for a considerable distance, for it is in the groove followed by the vessel that the knife blade fits and runs most easily.

Therefore the lateral incisions for raising flaps should be made as far lateralward as possible, the cut being directed outward against the alveolar process rather than upward against the palate. Likewise in making lateral incisions near the posterior border of the soft palate for division of the levator palatine muscle the ascending palatine artery is quite likely to be divided, this vessel being of considerable importance in the blood supply of the soft palate. It may truthfully be said that much more depends upon an adequate blood supply than upon the method of suturing the flaps. It is most encouraging after the completion of a cleft palate operation that the wound margins are red and not blanched. In rare cases of severe hemorrhage of the palatine arteries it has been necessary to plug the foramina of the palatine artery with wooden pegs. All of the well-known evil effects of hemorrhage may be circumvented with considerable certainty by the simple expedient of avoiding lateral incisions, or if such incisions are absolutely necessary, making them after the flaps have been elevated and the lines of tension determined, so that only small incisions properly placed are required. It is then usually comparatively easy to relieve tension either lateralward or medialward to the descending palatine or at a safe distance in front of the ascending palatine. To elevate flaps at the beginning of the borders of the cleft is as a rule not so difficult as to elevate the flaps through a lateral incision. A convenient practice is to grasp the divided half of the uvula with tenaculum forceps and split the border of the cleft in the soft palate lengthwise, but slightly on the nasal side of the margin. This split should be extended at once up to the posterior border of the hard palate with scissors-spreading dissection, keeping in the gland tissue between the oral mucosa and the palatal muscles; all of the soft palatal tissue may be rendered movable except the aponeurotic attachment of the tensor palati at the border of the hard palate. The aponeurosis and the attached nasal mucosa must be divided with the curved scissors close to the border of the hard palate, the division extending outward and backward, if necessary, almost to the posterior palatine foramen.

The anterior part of the soft palate next to the hard palate for a distance backward of 9 or 10 mm. contains practically no muscular fibers, being composed almost entirely of palatine aponeurosis. Therefore this portion of the palate is quite fixed and must be detached in order that the corresponding side of the soft palate may be moved toward the median line. It is remarkable how this simple step enables one to close, without lateral incisions and without tension, even the very widest defects. In thus dividing the palatine aponeurosis close to the hard palate margin, no muscle fibers are divided, no blood-vessels and no nerves of importance are severed, and it becomes possible to draw medialward the soft palate in almost its entire thickness. The oral mucous membrane of the soft palate is of course continuous with the soft tissues covering the hard palate. Therefore, after detachment of the aponeurotic layer at the posterior border of the palate bones, it is comparatively easy to continue the separation of the oral mucous membrane of the soft palate forward over the hard palate by the use of an appropriate raspatory or periosteal elevator.

One may begin by first elevating the mucoperiosteum from the hard palate, and then dividing the aponeurotic attachment of the hard and soft palates by passing one scissors-blade under the mucoperiosteum and the other in the nasopharynx, and by closing the scissors and cutting the aponeu-

rosis in the nasal mucosa. Since the raising of the mucoperiosteum from the hard palate is rather difficult in some cases, this may be facilitated by first splitting the edge of the soft palate near the edge of the palate bones, then dividing the aponeurosis, and then continuing the loosening of the flap through the split soft palate over on the hard palate following a continuous plane of cleavage. The paring of the edges of the cleft after division of the palatal aponeurosis and the relaxation of the soft palatal tissues at each side may be accomplished by traction on one-half of the divided uvula and cutting off with curved scissors the rounded border of the mucous membrane which might interfere with union. Drawing the half uvula taut with tenaculum forceps and rolling the relaxed border of the cleft toward the oral side, one may readily inspect its entire length, and with curved scissors cutting forward from the uvular end so freshen the mucosa, which may tend to turn around to the nasal side, that no mucous membrane can interpose between the united margins. Sutures at the posterior part of the soft palate must be secure enough to protect against the traction incident to swallowing, since there is a large amount of muscular tissue here. Coaptation sutures may with advantage be reenforced by a relaxation suture along the free edge of the anterior palatine arch—that is, the posterior border of the soft palate. Such tension or immobilization suture is introduced by passing a long curved needle bearing a long linen or hemp thread through the edge of the anterior palatine arch on one side near its base—that is, on the side near the tongue. The thread is drawn through to its middle and secured with a reef knot, leaving the tail of the suture long. At a distance of 3 or 4 mm. from the first or outermost knot, the needle is again passed through the edge of the arch; the tail of the suture is taken up and another reef knot is tied. This process is continued around the anterior palatine arch to its base on its opposite side, the suture crossing in front of the base of the uvula.

In closing narrow clefts of the soft palate additional security is provided by uniting the two split margins of the cleft as suggested by Ochsner. The sutures approximating the nasal mucosa will probably include in their grasp more of muscle tissue than those on the oral side and are of value as tension sutures. In the simple median suture, when the edges of the cleft of the soft palate are split (the splitting is done slightly on the nasal side), one can gain a few millimeters of additional width for the flaps, and this is especially appreciated by those who use mattress sutures for the closure. It is an error to introduce many sutures of any kind. Four or five should be enough if the wound is not under tension.

THE USE OF HIGH-FREQUENCY CURRENT IN THE TREATMENT OF TUMORS OF THE BLADDER.

BUGBEE (*Surgery, Gynecology and Obstetrics,* December, 1915) has written a collective review which he summarizes as follows:

The high-frequency current is an alternating current of from one to two million oscillations per second. When used as a monopolar Oudin current it causes superficial destruction of tissue, or when used as a bipolar d'Arsonval current it causes deeper destruction.

Used in the urinary tract it is the method of choice in dealing with benign papillomata of the bladder.

Malignant papillomata and circumscribed carcinomata of the bladder wall are best treated by wide resection of the bladder wall and destruction of recurrences by the d'Arsonval current.

In cases of extensive carcinoma of the bladder wall, the growth may be retarded and symptoms lessened by the d'Arsonval current.

Certain types of vesical obstruction—due to a small amount of tissue—may be cured by the destruction of this tissue with the Oudin spark.

Inoperable cases of vesical obstruction can be partially relieved by destruction of tissue about the vesical neck.

Failure will follow attempts to relieve such obstructions unless care is exercised in manipulations, and the treatments are given at wide intervals, a small amount of tissue being destroyed at each treatment.

The d'Arsonval current probably assists in dilating the ureter with the olivary bougie, and the Oudin spark may be an aid in releasing a calculus lodged in the lower ureter or at the ureteral orifice.

The Oudin spark may be of assistance in reducing a hypertrophy of the verumontanum or in destroying a urethral papilloma.

The Oudin spark is probably the best known agent for curing venereal warts, herpetic ulcers, and chancroids.

END RESULTS OF BONE FRACTURES.

ESTES (*Annals of Surgery*, September, 1915), as the result of a study by the Fracture Committee of the American Surgical Association, makes the following recommendations:

First, as a general principle, that fractures be treated by a skilled surgeon.

X-ray should be employed by a competent radiographer, or a fluoroscope should be used for diagnostic purposes before the permanent dressing is applied. At least two skiagrams should be taken, and they should be taken from opposite perpendicular directions.

Skiagrams should also be taken after permanent dressings are applied to prove proper reduction, and at the end of the treatment to show the result of the union and for the purpose of a graphic record.

Fractures should be reduced immediately after the injury if possible to obtain and apply proper retaining apparatus or splints. The statistics show markedly better results when the treatment is begun at once. It is, however, not only useless but cruel to subject the patient to the pain of manipulation for reduction unless the surgeon has proper fixation apparatus at hand and the patient is where he may have a permanent dressing applied.

General anesthesia should be employed as a rule to facilitate reduction and prevent pain, unless the condition of the patient contraindicates it.

Neither the non-operative nor the operative method is to be recommended exclusively. Each has its indication and should be employed when required. Generally speaking, the age period under fifteen years is the period in which non-operative methods are especially effectual. In the other age periods up to sixty years, operative methods may with confidence be employed when non-operative treatment has proved ineffectual in reducing or controlling the fragments in proper position. The operation should not be allowed longer than one week after the injury.

The open method when adopted should be employed early. It may be used at any age period, except in senile cases, whenever a skiagram shows a deformity or a position of the fragments which obviously cannot be reduced or when proper efforts at reduction and retention have proved unavailing.

Some form of rigid plate applied directly to the bone or an Albee "inlay" seems to be the best fixation method in operative cases.

Open operations for simple fractures should be undertaken only by experienced surgeons who are thoroughly equipped by training, and who have proper instruments and apparatus to meet all the possible indications of the operation.

The work of this committee has been greatly hampered by the inadequacy of the records submitted for its consideration. A large proportion of the cases had to be rejected entirely, and most of them were so incomplete as to make deductions based upon them possibly misleading.

The first step in the betterment of practice is the study of results achieved by present-day methods. An adequate study is impossible without adequate records.

The committee strongly urges the American Surgical Association to set its seal of approval upon the standard form of record submitted by the committee, and to further petition the American Medical Association to do the same. The committee also urges each member of this association faithfully

to keep these records in his practice, and to see that they are kept in the hospitals to which he is attached.

The committee further recommends that a copy of the approved form be sent to all corporations within the United States of sufficient importance to have their own relief organizations or medical service or both; to all accident insurance companies to be embodied and incorporated in the papers given to the insured, with the requirement that they be filled at the time of an accident involving fracture; to all hospital boards with the request that these records be made a part of the routine records of fracture patients, pointing out that thus not only are the hospital and its surgeons protected in case of litigation, but that most valuable material is being collected to serve for attaining better results in the treatment of fractures.

ONE HUNDRED CASES OF GASTROENTEROSTOMY AS COMPARED WITH ONE HUNDRED CASES OF PYLOROPLASTY.

FINNEY and FRIEDENWALD (*American Journal of the Medical Sciences*, October, 1915) note that the largest proportion of cases in which gastroenterostomy was performed occurred between the thirtieth and sixtieth years, while the largest proportion of cases in which pyloroplasty was performed occurred between the thirty-fifth and fiftieth years.

Of the total number of cases of gastroenterostomy there were 56 males and 44 females, while the total number in the pyloroplasty series numbers 63 males and 37 females.

The duration of the symptoms in gastroenterostomy cases varied from one month to nineteen years, the average duration being nine and a half years, while the duration of symptoms in the pyloroplasty cases varied between one and one-half months to twenty-five years, the average duration being nine and a half years.

In the gastroenterostomy cases the symptoms appeared in the following proportions: pain in 90 per cent (51 males and 39 females); vomiting in 65 per cent (36 males and 29 females); hematemesis in 23 per cent (18 males and 5 females); melena in 44 per cent (28 males and 16 females); retention in 36 per cent (19 males and 17 females); while in the pyloroplasty cases pain was present in 92 per cent of cases (58 males and 34 females); vomiting in 64 per cent (44 males and 20 females); hematemesis in 21 per cent (15 males and 6 females); melena in 46 per cent (29 males and 17 females); retention in 42 per cent (27 males and 15 females).

In the gastroenterostomy series the ulcer cases are arranged as follows: there are 46 cases of gastric ulcer (32 males and 14 females), 38 duodenal ulcers (15 males and 23 females), making a total of 84 cases. In the pyloroplasty cases there are 55 cases of gastric ulcer (36 males and 19 females) and 32 duodenal ulcers (21 males and 11 females), making a total of 87 cases. It will be noted that in both series there is a preponderance of males over females, and of gastric over duodenal ulcers.

In 67 of the gastroenterostomy patients operated on for obstruction 44 were due to gastric ulcer, 14 to duodenal ulcer, and 9 to adhesions, while pyloroplasty was performed for obstruction in 64 cases, for gastric ulcer in 51, for duodenal ulcer in 7, and in 6 for adhesions.

In the gastroenterostomy cases secondary operations were performed in four instances to correct immediate difficulties, while in the pyloroplasty cases secondary operations were required in the same number of instances for a similar purpose.

After gastroenterostomy satisfactory results were secured in 82 per cent of cases, and unsatisfactory in 18 per cent, while pyloroplasty was immediately successful in 90 per cent of cases and unsatisfactory in 10 per cent.

There were seven deaths following immediately upon the operation of gastroenterostomy, while but five deaths followed pyloroplasty.

Of the 77 cases of gastroenterostomy followed during the first year of the operation the results were satisfactory in 84.4 per cent

and unsatisfactory in 15.6 per cent, while of the 82 cases of pyloroplasty the results were entirely satisfactory in 93.9 per cent, and unsatisfactory in 6.1 per cent.

Of the gastroenterostomy cases, numbering 74, followed after the first year of operation, the results were satisfactory in 84.2 per cent and unsatisfactory in 15.8 per cent, while of the pyloroplasty cases, numbering 78, the results were satisfactory in 93.6 per cent and unsatisfactory in 6.4 per cent.

The end results in the gastroenterostomy cases showed a percentage of 77.2 of satisfactory recoveries, while the pyloroplasty cases showed a percentage of 88.6.

It is quite evident from this study that the immediate as well as the final results are clearly in favor of pyloroplasty. The only indications in favor of gastroenterostomy are, as already pointed out, in those instances in which there is an inability to mobilize the duodenum when adhesions are too dense, and in those cases in which there is a thickening and infiltration about the pylorus due to hypertrophic ulceration, conditions, however, which occur but rarely. Again, there is no possibility of excising the ulcers when performing gastroenterostomy, as can frequently be accomplished in pyloroplasty, when they are in the anterior wall.

While in some instances gastroenterostomy may be the operation of choice, nevertheless on account of its comparative unsatisfactory end results it should be as far as possible limited to the relief of stenosis of the pylorus, due to malignant disease; in nearly all other conditions pyloroplasty and pylorectomy are safer and more satisfactory procedures.

It will be remembered that Finney has already reported upon 13 years of pyloroplasty, and from one hundred cases drawn the following conclusions:

The operation has certain advantages over gastroenterostomy, and but few of its disadvantages.

The operation has its greatest indication in the relief of pyloric stenosis due to chronic ulcers, situated at or near the pylorus, and on either side of it, or resulting from cicatricial contraction following the healing of such ulcers. It is often a useful procedure in cases of hemorrhage due to gastric ulcers on the lesser curvature, or to duodenal ulcers which cannot be controlled medically, and which threaten the life of the patient, as well as in the chronic dyspepsias due to ulcers which have not been relieved by medical treatment.

The special advantages of this operative procedure lie in its affording the opportunity to excise all ulcers whether perforated or not in the anterior walls of the stomach or duodenum after direct inspection of the part affected; also the application of treatment to ulcers situated in the posterior walls. It does not greatly disturb the normal relation between the stomach and intestines, as is the case in other operations.

Such objections as are urged against the operation—*e.g.*, its inapplicability in the presence of adhesions surrounding the pylorus as well as in the presence of active and bleeding ulcers, and also because of the fact that the new opening is not at its lowest point, taking advantage of gravity—are more fanciful than real, since the operation has frequently been performed under these conditions with most gratifying results. The interesting experimental work of Cannon and Blake and others supports this contention.

The only contraindications to the operation are inability to mobilize the duodenum when adhesions are too dense, and thickening and infiltration about the pylorus due to hypertrophic forms of ulceration.

In atony or gastroptosis with slight motor insufficiency such as is observed in the water-trap stomach, or in nervous dyspepsia —*i.e.*, in gastric disturbances not dependent upon organic disease—this operation is contraindicated.

From experience with operation the immediate as well as the final results are most encouraging. While in some instances partial gastrectomy or gastroenterostomy is undoubtedly the operation of choice, nevertheless, on account of its simplicity and because of its satisfactory end results, pyloroplasty will continue to retain its position as a safe and useful procedure.

END RESULTS IN 242 CASES OF SIMPLE FRACTURE OF THE FEMORAL SHAFT.

SERGEANT PRICE MARTIN (*Surgery, Gynecology and Obstetrics,* December, 1915) after a careful study of this subject has come to the following conclusions:

In children fractures of the shaft of the femur involve mainly the middle third.

Ninety per cent of all cases of simple fracture of the shaft of the femur in children are followed by complete recovery.

In children at the time of discharge from the hospital (8 weeks) there is no stiffness in the knee.

The average period of treatment of children in bed and with crutches, splints, and bandages is two to three months.

In adults fractures of the shaft of the femur involve mainly the middle third.

Between the ages of fifteen and twenty-five years there is about 50 per cent of complete recoveries, while after twenty-five years the permanent disability is proportionate to the age of the patient. Men above forty years rarely regain strength and activity.

In adults in the absence of shortening there may be a lasting weakness of the leg and thigh. Permanent disability is as a rule associated with shortening, and is to an extent proportionate to the degree of shortening.

The average time in bed and with crutches, splints, and bandages in adults is eight months.

In adults at time of discharge (8 to 10 weeks) there is stiffness of the knee in 100 per cent of cases.

Among adult laboring men 90 per cent never become able to perform their regular occupations.

Among adult males not of the laboring class the great majority are able to perform their regular occupations.

The unsatisfactory results following the weight extension treatment of simple fracture of the femoral shaft in adults suggest that this method is either inadequate in itself or unskilfully applied.

Efforts for obtaining better results in adults should be directed to: (*a*) the employment of more weight in procuring extension, in the effort to entirely overcome the deformity; (*b*) early resort to open operation if extension seems inefficient; (*c*) the systematic use of massage and passive motion continued for months; (*d*) a longer use of crutches than is now customary; (*e*) education of the patient.

SOME EXPERIMENTAL DATA ON THE MORESTIN TREATMENT OF PERITONITIS.

POPE (*California State Journal of Medicine,* Vol. XIII, No. 6) quotes Morestin's communication of two years ago to the effect that sponging out the soiled peritoneal cavity with ether and leaving a quantity of this fluid in the abdomen is an admirable treatment. Auvray reported in corroboration a case of intestinal perforation, in which after cleaning the peritoneum and repairing the perforation he poured a quart of ether in the abdominal cavity and closed his incision after sponging out the excess of ether. The patient made a splendid recovery. Moreover, Delorme contributed an article commending the treatment.

From a theoretical standpoint the use of a toxic irritant, such as ether, in the peritoneal cavity certainly does not seem rational. In the first place, ether is not an antiseptic to any appreciable extent. It is a tissue irritant, a solvent of fats and colloids, and definitely toxic. More than this, one would question the beneficial effect of distending the abdomen with gas of any sort in the presence of an infection.

To determine the value of this method experimentally, a series of twelve rabbits was used, two of which were controls. Eight were treated as follows: Under general anesthesia the animal was laparotomized, the colon drawn out, an inch incision made in the viscus, and a portion of its contents smeared over the peritoneum. The intestinal wound was closed with silk, the peritoneum gently swabbed with sponges soaked in ether, a drachm of ether poured into the cavity, the colon returned, and the abdominal incision closed with silk.

When the ether comes in contact with the abdominal viscera, the animals experience pain, though previously anesthetized; later they seem shocked and are profoundly narcotized. Kymographic records show a pronounced fall in blood-pressure at this point, in studies on dogs. All of these rabbits developed a vicious peritonitis marked by hemorrhagic plastic deposits, purulent exudate, and agglutination of the intestinal loops. Six died within a few days from sepsis or obstruction. Two remained at the end of ten days in fair health, but showed multiple peritoneal adhesions.

Two other rabbits were opened, a drachm of ether poured in the abdomen, and the wound closed. Each developed a purulent peritonitis; one died the third day; the other died from a secondary anesthesia, at which time cultures were made and proved positive to staphylococcus aureus.

This shows that a sterile abdominal cavity, insulted by an irritant such as ether, is not capable of defense against its own intestinal flora. This has been proved before—that carbolic acid or any similar destructive agent, when put on a peritoneal surface with the idea of sterilizing the field, simply destroys the integrity of the tissues to such an extent that infection through the intestinal wall always takes place.

Two control rabbits were laparotomized, had their peritoneum soiled by a colotomy wound, were washed with salt solution, and closed. These made an uneventful recovery, and at autopsy presented a fairly normal peritoneum.

These few experiments show rather conclusively that for rabbits, at any rate, the treatment of the peritoneum with ether—whether infected or not—is a highly improper procedure. Animals so treated develop a purulent peritonitis or sustain an augmented lesion; recovering from this they present multiple peritoneal adhesions and may die of ileus.

The controls, washed with salt solution, do very much better and recover completely.

While this work is rather tardy and its findings unnecessary to convince many surgeons of the fallacy of the Morestin method, in view of its recommendation to army surgeons in the present war, and with the hope that it may deter some of the unwary from using this risky procedure, it is here placed for consideration.

CORRECTION OF DEPRESSED FRACTURE OF THE NOSE BY TRANSPLANTED CARTILAGE.

BECKMAN (*Surgery, Gynecology and Obstetrics,* December, 1915) notes that a large number of nasal deformities resulting from injury are of a depressed type—that is, the injury has crushed the nasal bones so that the bridge of the nose is flattened. The nasal bones are either forced backward upon themselves or separated and pushed out laterally. Many of these can be replaced immediately and held with splints. If not corrected a marked deformity will result. Adult cartilage can be transplanted from one part of the body to another under the same conditions that bone is transplanted, with uniformly good results. This transplanted cartilage is not dependent for its viability upon other cartilage or bone, nor is it necessary to preserve the perichondrium to secure good result. Adult cartilage when transplanted lives with no apparent growth or change in its composition up to three months. In several cases in which adult cartilage was transplanted from the rib into the nose for the purpose of replacing a defect in the tissues there have passed 2½ years with no apparent change in transplant. The tissue accepts the transplant kindly; even in one case of marked infection the cartilage finally healed in firmly. In another instance cartilage was kept in salt solution for five days before being transplanted. Primary union occurred just as if fresh cartilage had been used.

If the nasal bones are widely separated it is best to refracture them and place a lateral splint upon each side of the nose, letting the splint remain for five or six days, in order to procure a suitable narrowing of the bridge of the nose. As soon as it is certain that there are no breaks in the nasal mucous membrane and that the circulation

about the nose is again perfect, the transplantation can be made. Beckman has followed the custom of taking a portion of the costal cartilage from the seventh rib, since the cartilage is much broader at this point and a good-sized portion can be obtained, still leaving costal attachments between the ribs and sternum. One is often surprised to find that a large portion of cartilage is necessary to remedy an apparently small defect. A wax model of the nasal defect is valuable as a guide in shaping the cartilage, which may be easily whittled with a scalpel to any desired size or shape. No attention need be paid to the perichondrium.

An incision a quarter of an inch in length is made transversely through the skin over the nose and just between the two inner canthi at a point where the bridge of the ordinary spectacles rests. There is usually a slight wrinkle in the skin at this point, so the scar is not visible. With a periosteal elevator the skin and subcutaneous tissues are elevated from the bone and cartilage straight down the bridge of the nose nearly to the tip. The separation should not be carried laterally on either side farther than necessary to secure room to transplant the cartilage. The transplant is then slipped into place, and as the tissues have been separated only in the midline, the transplant is held in place and is not dislodged to either side. It may be necessary, however, to place a stitch at the upper portion of the transplant to keep it from slipping upward. The small incision is closed with two or three interrupted stitches of horsehair, and the wound sealed with cotton and compound tincture of benzoin.

CHLORIDE OF MAGNESIUM FOR DRESSINGS.

In *Le Monde Medical,* November, 1915, it is noted that chloride of magnesium was selected as a means of treating wounds, especially septic wounds, on theoretical grounds, though with some practical reasons, in order to dispense with the use of the antiseptics, which yielded our predecessors such brilliant results, in favor of substances which do not exert an injurious action on the living elements of the tissues. That is a conception laden with good intentions. Leaving on one side the first part of the theory, which would open the door to animated discussion, let it be conceded that antiseptics are always useful, sometimes indeed indispensable. Authorities of weight have recommended them *de novo* since they were so violently attacked, but alongside of this aspect of the question there is another, viz., that of liquids capable not indeed of destroying microbes but of infusing fresh vitality into the tissues, thus affording them great assistance in their defense against infection.

Among these liquids mention must of course be made of chloride of magnesium. Dr. Pierre Delbet spoke most highly of it in a paper bristling with facts and observations. Other observers indeed had previously recognized its advantages, and Dr. Rosenblith contributed a specially valuable chapter to the history of this body, which he has been employing for the last six months with very encouraging results.

Dr. Rosenblith in fact started using chloride of magnesium since June 15, 1915, in the hospital wards of the Lycee de Sailly, but as a matter of fact his early trials go back as far as March of that year. He makes use of a 25-per-cent solution in boiled water, and he mixes four tablespoonfuls (60 Cc.) of this solution with a liter of water. This makes a solution of about 12 per 1000. Dr. Delbet also recommends a 12.1-per-1000 solution, which he considers to correspond to absolute isotonus.

When this solution is employed for wet dressings, lavages, or compresses, cicatrization of the tissues according to the partizans of this method takes place much more rapidly than with the usual antiseptics. However abundant the suppuration may be, it soon dries up and cytolysis—*i.e.*, progressive destruction of the cells of the organism —is avoided.

But there is more in Dr. Rosenblith's communication than this restatement of the cicatrizing properties of this substance. He discusses the general properties of chloride

of magnesium when introduced into the organism. He was, as a matter of fact, led to employ this salt for dressings by observation of the results of using a solution of chloride of magnesium and iodide of sodium in rheumatism and pseudorheumatism, where he gave it in hypodermic injections. Observation of these cases, he tells us, seemed to justify the conclusion that these injections in addition to their stimulating influence on most glandular secretions exerted a tropho-cytogenous action on the tissues, modifying the humors so much that they became an unfavorable medium for the multiplication of a certain number of microörganisms.

In this way then chloride of magnesium may be regarded as an indirect antiseptic. In any event it is worth while calling attention to its value as a dressing. It cannot but occur to us that chloride of magnesium is one of the most important constituents of sea water, and that the only one which surpasses it in this respect is chloride of sodium, the remarkable healing and disinfecting properties of which have also been extolled. Those who make use of sea water *per se* for dressing wounds are evidently well-advised, since the sea, the source of all life on this globe, is after all the best preservative of the cellular life even when the vitality of the tissues has been gravely reduced.

CASES OF PENETRATING WOUNDS OF THE ABDOMEN TREATED JUST BEHIND THE BATTLE LINE.

TARTOIS (*La Presse Médicale*, No. 51, 1915) observes that in the Balkan campaign the rule of treatment was conservative. Also, in France he treated in a conservative manner eight cases of abdominal wounds, all of which died. All came under treatment twenty hours after their wounds, and the cause of death was in every instance peritonitis. Tartois therefore decided on surgical intervention. He treated fifteen perforating wounds by incision and suprapubic drainage; three recovered. He therefore adopted a still more active surgical intervention, opening the belly and making systematic exploration for visceral lesions. Of eleven thus treated five recovered. This study, the result of the experience of one surgeon who under similar conditions applied three general methods of treatment applicable to abdominal wounds, is highly suggestive. Conservatism gave 100 per cent mortality, drainage gave 80 per cent, whilst rational intervention gave 55 per cent. Eight of the cases treated by exploration and intestinal suture were due to bursting bomb. Three of these got well. One rifle shot and one shrapnel shot were also cured. The five cured cases were operated on within five hours of the time of the infliction of the wound. From this experience it would seem that the proper treatment of these cases is a systematic search for intestinal lesions.

In contrast with this single experience BOIT (*Deutsche med. Woch.*, June 10, 1915, quoted in the *British Medical Journal*, Oct. 9, 1915) notes the following interesting facts:

As the majority of the cases did not reach the hospital within twenty hours of the infliction of the wounds, and as there was little time for operating on those rare occasions when the patients were admitted early, the treatment of abdominal wounds was invariably and of necessity conservative. While the mortality among the patients suffering from wounds of the intestine was very high, the mortality from wounds of the stomach was surprisingly low.

Altogether 72 cases of abdominal wounds, not including wounds confined to the abdominal wall, were observed. The diagnosis of wounds of the abdominal cavity was made by locating the wounds and detecting symptoms of peritoneal irritation. In 14 cases the diagnosis was confirmed by necropsy. The spleen was wounded in one case and the liver in eight, and though two of the wounds of the liver were complicated by wounds of the lungs and kidneys, only one of these nine patients died.

Among the 50 cases of bullet wounds of the intestine, there were 30 about which exact information was available. Of these

30 patients 27 died, and judging from the course of the bullet it was evident that in every case the small intestine, and in a certain proportion of cases the large intestine also, had been wounded. The necropsies showed that the perforations of the intestine were most numerous when the bullet traveled in the long axis of the body, and in one case as many as fourteen perforations were counted in the same body. The wounds of the intestine were most extensive when they had been inflicted by bullets fired at close range or striking sidewise. In about one-third of the necropsies it was evident that the wounds were so serious that a satisfactory operation was technically impossible. In the remaining two-thirds the conditions were such that an early operation in favorable circumstances might well have saved the patient's life. In some cases the intestines were wounded but not perforated, the bullet having incised the serous and muscular coats, but not the mucous lining of the intestine. Such cases showed that the intestine was sometimes displaced by the bullet without being perforated; and this was the explanation also given by Enderlen, who failed to find wounds of the intestine in three cases in which the bullet had passed transversely through the abdomen.

Of the 30 cases of wounds of the intestine, 14 presented wounds of entry only, while 16 presented wounds of exit also. Among the latter were the three cases terminating in recovery. Curiously enough, in three cases both the wounds of entry and of exit had been inflicted by bullets traveling sidewise. In a considerable number of cases in which the bullet remained in the body, it had either struck sidewise or had been turned into this position after entering the body. The tendency of the modern infantry bullet to turn sidewise was, in Dr. Boit's opinion, largely responsible for the high mortality from abdominal wounds.

Of the 13 cases of wounds of the stomach, 12 were due to rifle bullets and one to a fragment of shrapnel. Only two patients died, both being wounded by bullets, which remained in the body. In the first case death was due to hemorrhage from a branch of the middle colic artery. The bullet had shattered the seventh rib on the left side in the nipple line, and the severity of the wound of the stomach was largely due to its laceration by fragments of rib. In the second case death was due to diffuse peritonitis. The bullet had entered in the mid-axillary line, below the ninth rib on the left side, and had perforated the stomach at two points. The patient had crawled back a distance of 300 meters to have his wound dressed. It was considered that the low mortality from wounds of the stomach in this series of cases was due principally to the fact that the stomach was empty. In practically every case no food had been taken within five to twelve hours of the infliction of the wound. Another important factor was the level at which the stomach was wounded; in the second fatal case the stomach was perforated in the most dependent part of the fundus, whence the escape of its contents was most easy. The prognosis was best when the stomach was wounded in the lesser curvature, and near its cardiac end; and it was worst when the stomach was wounded in the fundus or near the pylorus. The symptoms were very variable. In some cases vomiting occurred at once, and in others it supervened a few hours later. In other cases, again, the wound provoked nausea only. There was every degree of shock, but only in one case was the wound immediately followed by hematemesis. Many of the patients remained lying where they were wounded, while others walked a considerable distance. The pulse was at first almost invariably rapid, and intestinal peristalsis was either reduced or totally inhibited. Rigidity of the abdominal wall was a constant sign. All the symptoms improved with astonishing rapidity, and usually disappeared in two to four days.

The favorable course of these cases confirmed Dr. Boit in his view that conservative treatment was the best for wounds of the stomach. Operation should be attempted only when there was severe hemorrhage, and also possibly when there

were signs of extensive laceration of the stomach. It was more difficult to decide how to treat wounds of the intestine. It was obvious, however, that a man with an abdominal wound should be kept as quiet as possible, and should not be moved before the fourteenth day after the infliction of the wound. Dr. Boit had made a post-mortem examination in two cases in which, owing to the transport of the patients, in one case on the sixth day and in the other on the tenth day, limited peritonitis was converted into a general peritonitis by the breaking down of adhesions. Motor cars for the transport of the severely wounded had not been available for his patients till the seventh month of the war. Previously they had been, as a rule, transported on straw in primitive carts. When a case of wound of the intestine was admitted to the hospital within eight or twelve hours of the infliction of the wound it was, in Dr. Boit's opinion, advisable to operate if other conditions were favorable.

SURGERY OF THE PALATE.

Brophy (*International Journal of Surgery,* November, 1915), whose name is identified with a method of treating cleft palate, which in his own hands seemed to be safe and efficient, contributes, as he does always, a most interesting and instructive paper.

The Brophy operation for the treatment of congenital cleft of the hard palate consists in taking advantage of the opportunity offered in very early infancy to move the bones in contact when they are soft and easily bent, and to carry them into their normal relations.

Bone, at birth, is about one-half organic matter, hence the bending and moving of the separated bones of the palate into contact may be easily accomplished.

To wait until the bones have become more widely separated and more highly ossified, the teeth erupted, and the deformity increased, is to invite complications that should be avoided.

It must not be understood that these bones are crushed, as has been said by men unfamiliar with the operation. They are not crushed. To crush the bones in performing this operation within the first six months of life would be impossible. They are not broken, but, at a time in life when they are soft and flexible, they are bent and moved into correct relation.

This operation is attended by only slight hemorrhage, as no vessels are divided. The hemorrhage which occurs is caused only by the passing of the needles and the scarifying of the borders of the cleft just before its edges are brought in contact.

The surgical shock is less in a young infant than it would be in an older one. The nervous system of a young child is not so well developed, and is not, therefore, capable of receiving the same impressions as it is later in life. Besides, young children usually react better. Moreover, the element of mental apprehension is not present, and we know that alarm and dread are among the most powerful factors in producing shock.

If the muscles are brought into action early, they develop instead of atrophy, hence a good velum is secured with plenty of tissue; whereas if the operation is undertaken later in life, the parts, not fully developed through non-use, cannot so easily be made to subserve the same purpose as tissues which develop through natural employment. It is well known that muscular tissue is more perfectly developed through action.

In cleft palate none of the muscles of the velum can be normally employed when the parts are ununited, hence they remain in a partially developed condition through life. By operating at an early age, these muscles are brought into use and their development is proportional to other tissues.

As a consequence of early operation, there is much less deformity than is the case in a later one, as all the tissues, bony as well as soft, develop naturally and according to accepted types.

When the palatal processes of the maxillæ are united, it will be observed that the bones in the development of the alveolar

processes of the upper jaw assume a form nearly or quite normal, and when the teeth are erupted they will occlude properly with the lower ones, or nearly so. The normal relations in early infancy of the superior maxillary bones are restored by moving them together and holding them there until they unite.

In patients not having sufficient bony tissue to close the cleft by this operation without contracting the arch, the author has found that as time passed the bones developed and the arch spread until, when the upper teeth erupted, they occupied nearly or quite the correct relation to the lower ones.

The most beneficial result of the early operation is that it permits the normal development of the function of speech.

Though realizing that there would be a great advantage in closing the entire palate in one operation, experience has shown that the best results are secured in overcoming this deformity by operating in early infancy, first upon the bones, and as soon thereafter as expedient upon the lip, and finally, when the child is from twelve to fourteen months old, upon the soft palate. By so doing normality is produced in all the parts.

The child operated on in early infancy will be better nourished following the operation and its general physical condition will improve rapidly.

It is fallacious to operate on the harelip before closing the palate. The lip must not be operated upon first. One cannot, without great difficulty, close the cleft of the bones by transfixing them and secure immediate union after the harelip is closed.

LOCAL ANESTHESIA IN HERNIOTOMY.

JACOBSON (*American Journal of Obstetrics and Diseases of Women and Children*, November, 1915) reports on 125 cases of operation on hernias without any deaths, local anesthesia having been used in all. Preliminary injection of morphine and scopolamine is given, sufficient to allay nervousness. In only three of the operations was it necessary for completion to give a slight amount of ether. These were among the earlier cases. A freshly prepared solution of ½-per-cent novocaine is injected about the site of operation; thereafter a wait of ten to fifteen minutes after injection, some care in handling the tissues, together with supplementary injections in the subperitoneal space around the neck of the hernial sac, render the operation painless. Pain may be experienced when intestinal adhesions to the interior of the sac are encountered, but supplementary injections and care in dissecting will avoid this pain. The tissues are thoroughly relaxed, thus allowing transposition and extensive overlapping. The solution used can be rendered sterile by boiling. Such solutions should be made from the novocaine crystals in salt solution and boiled for three minutes, the adrenalin being added just before the solution is removed from the flame. Solutions prepared in this way are always sterile and do not irritate the tissues. The incision does not go beyond the infiltrated area. The author reports but a single infection due to faulty preparation of the solution.

Two points are selected for the entrance of the needle, the first within three finger-breadths of the anterior superior spine of the ilium, and the other just above the spine of the pubis for inguinal hernia. Through these two points, first anesthetized by an ordinary hypodermic needle, the entire field of operation is surrounded by the solution, first under the superficial layers, and then under the deeper external oblique fascia. The author has noticed no toxic effect from the use of the ½-per-cent novocaine and adrenalin solutions which he has employed for these operations. In one double hernia he used 12 ounces of the solution. The average amount of solution employed is from 3 to 6 ounces. It is interesting to learn that one out of every 22 persons has a rupture; in 1913, 3.81 per 100,000 people died of hernia. The frequency of this condition in an otherwise normal individual should make it the most common of all surgical operations.

REVIEWS.

CANCER OF THE STOMACH. By Frank Smithies, M.D. With a Chapter on the Surgical Treatment of Gastric Cancer, by Albert J. Ochsner, M.D., LL.D., F.R.C.S. W. B. Saunders Company, Philadelphia, 1916. Price $5.50.

This monograph upon a very important subject is printed in such large type and heavy leading that it is unnecessarily bulky. These facts, on the other hand, render the text easy of perusal. The author bases his views chiefly upon the clinical study of 921 cases demonstrated to be gastric cancer on the operating table, or in the autopsy room. These cases have been seen by him in the University Hospital in Ann Arbor, Michigan, in the Mayo Clinic, in Rochester, Minn., and the Augustana Hospital in Chicago.

There is, so far as we know, no recent monograph upon this topic, and, therefore, the present publication is timely.

It is needless to point out that the chapter upon the Operative Treatment of Gastric Cancer, by Dr. Ochsner, is written by one who is thoroughly familiar with this important subject. There are few conditions in which careful consultation between the general practitioner and the surgeon are more important than this.

In addition to the surgical chapter upon treatment, there is one by the author upon Non-Surgical Treatment.

Altogether there are twelve chapters, the book concluding with a list of the names of those who are quoted, and an adequate Index.

After giving interesting statistics as to the distribution and frequency of cancer in its various forms, and especially cancer of the stomach, the author takes up the study of its Morbid Anatomy, Symptomatology, and the various methods which are resorted to in its diagnosis.

One of the most important chapters is chapter eight, upon "The Significance of Gastric Ulcer with Respect to Gastric Cancer." There seems much evidence indicating that many gastric ulcers eventually undergo malignant change, and this must be considered in determining whether a case of gastric ulcer is to be subjected to radical surgical treatment.

Many of the ordinary text-books upon medicine consider the problem of gastric cancer sufficiently thoroughly to meet the needs of the general practitioner, but those who are particularly interested in this important subject will do well to possess themselves of this volume, since it may be truly said to present the most recent views in regard to a matter which comes before every active medical and surgical practitioner many times in the course of the year.

THE PRINCIPLES AND PRACTICE OF PHYSICAL DIAGNOSIS. By John C. Da Costa, Jr., M.D. Third Edition, Thoroughly Revised. W. B. Saunders Company, Philadelphia, 1915. Price $3.50.

In the six years which have elapsed since the publication of the first edition of this book the new facts which have been developed in physical diagnosis are not very numerous. Nevertheless, certain additions have been made to our methods of investigating disease by the aid of physical diagnosis. These are carefully considered, and when of value are commended in the present volume.

As with most books which reach the second and third edition, the third edition is somewhat larger than the first, although the author has endeavored, by careful revision, to prevent the book from becoming unduly bulky.

The parts of the book which are distinctly new are those which deal with Electrocardiography and the X-Ray Examination of the Stomach. A careful consideration is also given to the newer theories and facts which have accumulated in regard to auricular flutter and ventricular fibrillation. It is these portions of the book to which the purchaser will turn at the present time with the greatest interest and profit.

As Dr. Da Costa has been for a number of years actively engaged in the teaching

of physical diagnosis, he knows the needs of the students and practitioners, and he is able to present the subject in a manner which is both interesting and practical.

SPEAKING OF OPERATIONS. By Irvin S. Cobb. George H. Doran Company, New York, 1915. Price 50 cents net.

It has been said that Irvin S. Cobb is the true successor of Mark Twain. In this little book he has certainly presented the condition of the patient before and after operation in a most ludicrous manner. The book will be enjoyed by medical men, who will recognize things and conditions that they often see, and it will cause equal mirth on the part of the patient who has been "through the mill."

As with many other contributions to literature which are primarily designed to be amusing, many medical men, while being amused, will have facts called to their attention which can be bettered by a little caution and due regard for the patient's feelings.

As a means of obtaining a hearty laugh after a hard day's work, the book is to be cordially commended.

MEDICAL LECTURES AND APHORISMS. By Samuel Gee, M.D. With Recollections by J. Wickham Legg.

We doubt whether many practitioners will desire to purchase this book, although, on the other hand, it may be truly said that its various chapters possess definite information of clinical value. The text is essentially made up of lectures and aphorisms covering a fairly wide field in medicine.

The book opens with the history of a case of cerebral hemorrhage, and this is followed by a consideration of the meaning of the words "Coma" and "Apoplexy." The third chapter deals with Large Heads in Children, the fourth with Aphasia, and the fifth with the meaning of the word "Delirium." The sixth and seventh chapters deal with Nervous Atrophy and Spinal Myalgia. These are followed by chapters upon the Causes and Forms of Bronchitis, and on the Nature of Pulmonary Emphysema and Asthma. There are also chapters upon Enlarged Spleen in Children, Tubercular Peritonitis, Signs of Acute Peritonitis, and Sects in Medicine. After these fifteen chapters, which make up practically half of the volume, are the "Clinical Aphorisms." These deal with a host of symptoms and diseases varying from Hemoptysis, Stinking Expectoration, Hysterics, and Headache, to Myelitis and Diabetes.

As the book covers less than four hundred pages, and the spacing is wide, it can readily be understood that none of these matters are considered in exhaustive detail.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures, etc. Edited by Henry W. Cattell, A.M., M.D. Volume Four, Twenty-fifth Series, 1915. J. B. Lippincott Company, Philadelphia, 1916.

For many years we have called attention to this publication, which frequently contains lectures or articles of considerable value.

Possibly the most interesting contribution to the present number, which celebrates the twenty-fifth anniversary of its publication, is a brief contribution entitled "The Coming of Age of Internal Medicine in America," by Sir William Osler. Other articles of importance are upon the Causes and Cure of Pellagra, the Duodenum in Health and Disease, and Progress in Obstetrics and Gynecology, by J. W. Ballantyne of Edinburgh.

BANDAGING. By A. D. Whiting, M.D. W. B. Saunders Co., Philadelphia and London, 1915. Price $1.25 net.

This admirably illustrated and expressed brochure upon Bandaging constitutes a complete and efficient guide to this practical branch of surgery. The author recommends that muslin be used as the material for bandaging by all beginners, that they may thus learn how a perfect bandage may be applied, and will soon discover that a similar bandage, except in a few instances, can be applied with gauze. He observes wisely that "accomplishment of purpose, rather than creation of a thing of beauty, should underlie every attempt to apply a

bandage. He classifies them under three headings—the roller, tail, and the handkerchief. This is a serviceable book which can be warmly commended.

THE PRACTICAL MEDICINE SERIES. Under the General Editorial Charge of Charles L. Mix, A.M., M.D. Volume VII, Obstetrics. Edited by Joseph B. De Lee, A.M., M.D., With the Collaboration of Herbert M. Stowe, M.D., 1915. The Year Book Publishers, Chicago.

Lee in his summarization of the year's progress in Obstetrics has shown discriminating judgment in the selection of material likely to be serviceable to the medical man who wishes to keep himself perfectly informed. The first part is devoted to Pregnancy, with a very satisfactory discussion of the Abderhalden test, its limitations and applications. The Toxemia of Pregnancy, including Eclampsia, is also considered at length. Knoop is quoted to the effect that the declining of the birth-rate is brought about by a voluntary limitation of the number of children.

The second part is devoted to Labor, much space being given to pituitrin and its use and also to the question of twilight sleep.

The third section is devoted to the Puerperium; the fourth to the New-born.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

This month the bad weather has continued, and there have been very few hours of sunshine to relieve the monotony of the rain and slush. There have, however, been a few days of hard weather with frost at night, which has in the immediate neighborhood of London rendered the surface of the ground very sticky, and subsequently moist and muddy.

Owing to the fact that there has been very little activity in France, there has been only a slight influx of military patients as compared with previous times. Those cases which have come in have consisted, as far as my own observation goes, of indefinite pains, which are labeled rheumatism, a few mild cases of trench feet, a few cases of paratyphoid of a very mild type which have been overlooked at the front, and a few oddments such as weak hearts, bad teeth, and so forth. Most of the cases complaining of pains in the lower limbs only seem to be dependent upon corns and callosities on the feet. The pains disappear with a few days' rest in bed, during which time we have made great efforts by the aid of fomentations, scraping, etc., to get the feet into good condition. The men themselves are much gratified by this attention, and say they are more comfortable than they have been for some time previously. Considering the number of men whose teeth are now being put in order, there ought to be a slump for dental surgeons for some few years after the war.

There does not appear to be any sign of a great epidemic, although the public health authorities are inclined to anticipate it. A few cases of German measles have been seen, and the Public Health Department controlling this district have considered it advisable to include German measles in the schedule of notifiable diseases. At the beginning of this month, I had a case of German measles in an officer's home. He was in a ward with three others, and was promptly isolated. Just over a fortnight later the three other occupants of the ward developed temperatures up to 103° lasting a couple of days, for which no abnormal condition was detected. None of these three had any rash or glands.

An important discussion is taking place in the columns of one of our leading daily papers on the question of the shortage of doctors in this country, and the correlated question of the supply of doctors for the

new army. During the last few months a self-constituted and influential War Emergency Committee, acting largely under the auspices of the British Medical Association, has been active in trying to get a large number of men to join the Royal Army Medical Corps. This committee is in close touch with the authorities at the War Office. The complaints of the doctors voiced in the columns of the newspapers may be roughly divided into the following headings: (1) That the authorities are bringing pressure to bear on all medical men under forty-five years of age to join the colors. (2) That there are already 10,000 medical officers attached to the army, which is at present believed to number three millions, and that this number is in excess of that which is actually required. (3) That the organization of the R. A. M. C. needs considerable modification, especially as regards the question of the best utilization of the material at its service. (4) That the needs of the civil population are not being sufficiently considered, and that there is a considerable possibility of the occurrence of an epidemic during these strenuous times, to cope with which a sufficient number of medical men are not being left in the country. Under the first heading it may be remarked that this committee is doing its best by obtaining a census of medical men in each district, and arranging that no district shall be denuded of its medical attendants, but that only such as can be spared should be asked to join.

I have recently talked with sundry medical men and tried to gather the point of view with which they regard this question. Every one is willing to do his best, but they point out that if they leave their practices their patients will go elsewhere, and they will not be able to recover them on their return. From the point of view of the public their going away is looked upon as a source of injustice, and the remark is made, "If you go away now it is quite likely that you will go away on some other pretext another time." The bonus which the government offers at the end of a year, two years, or at the end of the war, is quite insufficient to meet their present loss. For the man whose practice is largely composed of panel patients this does not matter to a great extent, as it would be quite simple to arrange for him to receive a proportion of the fees of those patients (already much reduced in numbers) on his panel, and simple legislation could insure him having a number of patients on his return. It is, however, another thing with the man who has worked up a practice in a different class of the community. It has been suggested that the government should buy these people out, and get what they can on any future transactions. This in itself is impracticable. With regard to the second point, it is proposed to raise the number of the R. A. M. C. from 10,000 to 15,000, and it is believed that the army will ultimately number four millions. Half as many medical officers as are now in the service are therefore required to come forward. As the army is at present only to be increased by one-third, there is an obvious discrepancy, and the disproportion in these figures is not understood. The present numbers, it will be observed, allows one doctor for each 300 soldiers, whereas the new figures would mean one medical man to 266 soldiers. It is of course quite possible that the number of the present army is below that first intended, but a 4,500,000 army would be the full proportion which the country can rely upon, even under conscription, with our population, and this leaves very little over for the abnormal proportion of men who must be employed on munitions, work for export, transport, etc.

Under the third heading there are many debatable points. It is contended that medical officers are required to do a large amount of clerical work which could readily be deputed to a skilled clerk, such as non-medical details of histories, case-sheets, etc., details required in the present system of invaliding, the large amount of detail required in the ordering of diets, and the filling up of certificates in the duplicate and triplicate. The diets seem to come under considerable criticism, inasmuch as

the army administration does not accept the principle of fixed dietaries such as is usual in civil hospitals. I am told that one ingenious medical officer got over this difficulty by having rubber stamps made for the different items of the dietaries, and was able to print on the sheets the diet for the individual soldier, thus saving several minutes writing. There also seems some ground for complaint against the method in which individuals are employed. Instances are quoted where a hospital surgeon was in the trenches, whereas his late resident was further back at the field ambulance doing the operations, and a highly skilled physician was doing the work which could quite as well have been done by a man recently qualified. From the point of view of the army, the man is most useful who can be sent anywhere at a moment's notice, and the War Emergency Committee is asking the more highly trained men to offer themselves under the same conditions as those who have only recently been qualified; and in this respect is not even adopting the precautions taken by the Munitions Department. The average medical man, and the public generally, appreciate that the specialist is worth considerably more than the newly qualified man, and realize the absurdity of putting a member of a hospital staff in a position subordinate to that of the man who was recently qualified. The situation is, of course, very full of difficulties, but no doubt the solution of the problem will be forthcoming.

As regards the fourth point, there can be no doubt whatever that those remaining in this country are doing a great deal more work than in peace time, and are unable to take the holidays which are advisable for the sake of health. Residents are occupying more than one post, staffs of hospitals are overworked owing to many men being absent, the general practitioners are carrying on the practices of those who are absent, and this condition of overstrain will be made worse the more the ranks of those at home are depleted. I do not personally see why it should be anticipated that an epidemic should occur (wages are high and unemployment hardly exists), except that there are undoubtedly a number of infected soldiers being brought back to this country, such as mild cases of typhoid and paratyphoid, and cases of dysentery. It is always possible that an epidemic might arise of one of these diseases, but so far there is no sign of it. Various suggestions to improve matters have been put forward, such as the disbandment of some of the field ambulances which are training in this country, whose personnel are not (at present) employed in medical work. It is represented that in the present stationary warfare field ambulances can be dispensed with. It has also been suggested that the R. A. M. C. should be considerably reorganized with simplification of their duties in regard to the various points mentioned above. Various other schemes have also been mentioned. However, the scheme which I believe would be most acceptable to the medical profession would be one based upon an arrangement by which the R. A. M. C. provided the administration, and civil doctors in rotation carried out the professional treatment. I have no doubt that if some such scheme were adopted, every medical man in the country would be able and willing to give his services for periods of three months each year, and would not cripple himself in doing so. Any of the controlling bodies of the medical profession, such as the College of Surgeons and Physicians, or even the British Medical Association, could take in hand the organization of the civil rota, while there must be enough regular officers to provide for the administration. Another scheme was suggested by which a rota of medical men could be formed, from which any number could be drawn on a few days' notice, to meet an emergency. This does not appear to be as satisfactory as the former. Apparently, however, the War Office does not favor any other scheme than that by which the medical officers become part and parcel of the army, for a given time, or until the war is over.

THE THERAPEUTIC GAZETTE

INCORPORATING

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ORIGINAL COMMUNICATIONS.

HISTORICAL STATEMENT OF THE INSTITUTION OF THE COLD FRESH AIR TREATMENT OF PNEUMONIA.

BY W. P. NORTHRUP, M.D.,

Physician to the Presbyterian Hospital, New York.

It is difficult to say at what date the treatment of pneumonia in the open air was "instituted"—about 1900 perhaps. In 1904 the report shows that the Presbyterian Hospital had recognized the value of open air and had begun an open-air ward for the systematic treatment of pneumonia and fever patients out-of-doors. A few ultra-enthusiasts, no doubt, long ago treated fever patients and possibly pneumonia in the open air, and even before the tuberculosis treatment was established. It remained for some one to place the open-air treatment of pneumonia on a safe basis. In short, it required the backing of a hospital responsibility to insure its adoption.

Sixteen years ago the pneumonia jacket was losing favor, the poultice was used sparingly; drugs were having it all their own way. Pneumonia was treated, not the patient. Little was said about the feeding of the case and nothing about the air it breathed. The heart was the main organ to be watched lest it fail. A failing heart called for more alcohol and strychnine, and digitalis was king. In this connection it is interesting to note that in later years there has been animated discussion as to whether most of the digitalis of the stores was inert, and whether there is little or no value in strychnine. The treatment of pneumonia was academic—one treated the pneumonia.

Not pleased with the padded rooms and oiled silk jackets, restless, muttering patients swathed and sweating in a "mousing" atmosphere, I gradually backed from the treatment and drew the patient nearer to the open window and the open air. It was not a sudden inspiration, but a slowly growing conviction that the best care of the patient, the best stimulus to the heart required cold, drifting fresh air and lots of it. When I published my first case a doctor in the audience came forward and said, "You treated my child that way eleven years ago." I had forgotten the date; time goes quickly.

It is probably the experience of all that one's nearest associates are the hardest to convince. It was the young hospital staff that first came in intimate touch with the cases and were the first converted. The following case gave perhaps the first start to the rolling ball. In making the rounds, beginning on the right-hand side as usual, I heard a groaning from behind a screen on the extreme left, corner bed. On inquiry I learned that a severe case of pneumonia had come in during the night and was so desperately bad that he had been accorded the privilege of a corner bed and the kindly screen, in order that the poor fellow might have all the privileges possible in a public ward, while he passed away to join his fathers. We cut across to the bed that would be last in our rounds to investigate the case. Here was the traditional treatment of pneumonia, in full activity; every attention had been given the patient, and all kinds of hypodermics were lying unabsorbed beneath his epidermal covering. The air about him was that of a large, well-ventilated ward. He was blue, puffing eighty to the minute, groaning, apparently comatose—hopeless. A complete description of

his general appearance would make a classic dying scene.

In twenty minutes a convalescent patient in a small outside room had exchanged places with this man. The huge window was pushed far up, the bed's head was dragged as near as possible to it, and cold fresh air was dropping on the face of our dusky man, late of the corner bed. What was the result? The patient still breathed eighty to the minute, but his face became less dusky, his eyes opened, his nose involuntarily reached up to the incoming air, and an expression came into his face not before seen. Doctors were amazed—nurses horrified. When anything was to be done the nurses involuntarily started to close the windows. Then the unusual happened. The patient waved them away. He was too busy gasping to waste breath on words, but eagerly motioned the window up and them away from the space. The most difficult thing to do was to keep the nurses from closing the window. Almost unconsciously on the least exposure the window was closed. At last the idea entered their minds that cool fresh air was all-important.

On my next visit to the hospital I heard rumors of a patient being killed by cold air, in ward seven. The place was full of rumor. The next day the story was changed, and it said a patient was being cured by cold air. The actual result was that the patient began to improve at once and ultimately fully recovered. The temperature was very high, the respiration eighty per minute, etc. This case impressed the young men, and they made a note that cold fresh air does not always kill pneumonia patients. By such striking cases the practice hitched along until it became the routine treatment. The greatest final impetus was given to the adoption of the practice by the results of the following striking case. The account from the *Medical Record* illustrates the prejudices to be overcome and the need for cautious proceeding. I may further add that all went easy thereafter.

The history of the case was as follows: Female, fourteen months. It had had rickets and scurvy, could not make the first effort at walking. Its legs hung down like empty stockings. It had a well-marked rickety rosary and prominent abdomen. Its general appearance, however, was that of a "pot-bellied," feeble, perspiring child, with much curly hair; in coloring, in the fairness of skin, with delicate touches of rose in the lips and occasionally in the cheeks, in darkness of eyes and hair, it was a beautiful child. Even one less near to it than fond young parents, doting grandparents, and loving aunts, of which it had a full quota, could not help feeling a strong attraction.

The diagnosis was bronchopneumonia. Pulse, 180-140; respiration, 60-40; temperature, 105°, delirium. One would not call this a mild case.

I told the parents that the one thing which would help the anemic little one to bear her poison, eliminate it, redden her blood, and sustain her heart, was cool, flowing fresh air, day and night. I said the child had a sore lung, a limping respiration, diminished breathing room, that to air its blood it had to pant, and panting was hard for the heart. To be kind to the patient, we must give her oxygen-full air, not second-hand breaths. She must not be made to breathe five times where three would do.

"The child," I said, "could not catch cold from air touching her face. The dry skin of a fever patient was not susceptible to cold. A fever patient in bed was quite safe. Cool, fresh air reddens the blood, stimulates the heart, quiets restlessness, favors sleep, improves secretions and digestion; in short, meets most of the indications for treatment of pneumonia in infants."

The largest room practicable in the house was selected, the crib was placed near the middle wall opposite the two windows and two doors; one window and one or two doors were constantly open. The month was December, and the weather was exceptionally cold. The windows were open night and day, and one night the thermometer in the room reached 28° F. In compassion for the nurses the friends of the family produced two automobile fur coats, which they wore night and day.

The little patient was fired to an internal

heat of 105°. Her pretty little face was bathed by cool, flowing air, and she slept. If, by reason of necessary exposure, the windows and doors were closed temporarily, she showed restlessness, which disappeared when the windows were again opened.

There were two tendencies of the case—one to become flatulent and distended, the other to have cold feet. Each time either condition prevailed the face became dusky, restlessness was marked, and at times there was delirium. For these two conditions the sovereign remedies were the foot-bath and high hot saline injections. For heart stimulant, a hot foot-bath; for flatulence, a hot, high saline injection; for restlessness, either or both of these. These two afforded relief, followed by three hours of sleep. In giving the foot-baths, the child was elevated on a firm pillow, and the feet were let down into a basin under the bed covers; hot water was added a little at a time, with constant friction of the feet. The action of these two derivatives, hot foot-baths and hot high salines, was enough to remove all untoward symptoms.

The case ran a course of twelve days, recovery taking place by crisis. The best is yet to be mentioned. The digestion in this case had given great trouble. At the onset of the pneumonia there was diarrhea with green mucous stools. The toxins of pneumonia disturbed the digestion still further, and the tendency to flatulent distention was marked. It was a constant problem to find anything which would be digested. But as soon as the crisis had passed and the fever was gone, the child simply opened her eyes, smiled, and began to digest her food as though nothing had happened. She was a trifle pale and rather weak, but a less damaged baby I have never seen. Here is a striking illustration of the peculiar feature that the disturbance of intestinal digestion ceases with the ending of high fever.

The nurses said that they endured their vigils much better, were fresher and wider awake from having constant good air. They declared that my prognosis was fully justified, and believed that the patient passed through with less exhaustion than any other they had ever known.

This point I wish to reiterate: This feeble child passed through her serious infectious disease with less injury to her general nervous system than any other I have known.

If any one thinks the institution of such a radical change in the treatment of this terrible disease, such overturning of tradition, was not revolutionary, I submit the following as an example of what frequently occurred in daily experience:

Casual meeting and conversation. Scene in street-car; strap-hanging. Enter car friend of the family: eager expression. "How's that child?" This doctor friend of the family I had not seen in six months, but somehow I seemed to know whom he meant by "that child." "How's that child: has it really pneumonia? I won't believe what I hear until you tell me yourself that it is pneumonia. Are you treating it in a cold room with all the windows open in the month of December?" I plead guilty. He added, after a long look, "Well, all I've got to say is, if anything goes wrong with that case, I pity you." He added that their social position and their host of friends—well, you know what was in his mind.

One evening, in a pneumonia season, I alighted at a Westchester station, and from the doctor's carriage entered a well-lighted house—surprised to find a host of friends, suggestive of an evening party. What I found was more than hinted at in the following prescription:

How to Kill a Baby with Pneumonia.—Crib in far corner of room with canopy over it. Steam kettle; gas stove (leaky tubing); room at 80° F. Many gas-jets burning. Friends in the room, also the pug dog. Chest tightly enveloped in waistcoat poultice. If child's temperature is 105° F., make a poultice thick, hot, and tight. Blanket the windows, shut the doors. If these do not do it, give coal-tar antipyretics and wait.

The doctor at once instituted the most approved open-air treatment and adopted the regular practice thereafter. That means, of course, that the treatment was satisfactory in its results.

At the present time there are multitudes of hospitals having open sheds, and some having fully equipped open-air wards, the Presbyterian and Mt. Sinai hospitals being, as far as I know, the first two to build complete open-air wards.

In Philadelphia the Jefferson Medical College Hospital has two such wards.

DIAGNOSIS, COMPLICATIONS, AND TREATMENT OF PNEUMONIA IN CHILDREN.[1]

BY H. BROOKER MILLS, M.D.,

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Pneumonia in children occurs either in the form of bronchopneumonia, frequently called catarrhal, or lobar pneumonia; and of the two forms broncho is, of course, by far the more prevalent. Various ages have been suggested under which the attack is likely to be bronchopneumonia and after which it is more likely to be lobar, and these ages vary all the way from two to five years, but personally I feel, particularly in view of experience during the present epidemic, that even five years is too low. A very good reason for this is that bronchopneumonia, being practically always secondary, follows, among other diseases, the acute infections of childhood, which are most common during the early school years. That bronchopneumonia may occur as a primary affection cannot be denied, although it is evidently very rare, the highest estimate with which I am familiar being five per cent of the cases. In making a diagnosis, therefore, of bronchopneumonia, one always has three important points to start with, viz.: the age of the patient, the history of a previous illness, and the existing bronchitis. Adding to these three points three other symptoms which rarely fail to be present, viz., increased pulse, increased respiration rate, and fever, a provisional diagnosis can usually with safety be made, particularly if there be at the same time dilatation of the alæ nasi and definitely localized mucous râles. The physical signs rapidly develop and are many and varied, no two cases really being alike. For this reason it has been stated that the presence of physical signs should not be necessary to make a diagnosis of bronchopneumonia (Kerley). However, among other physical signs that may be present in addition to the localized mucous râles already mentioned is the fine, crepitant râle which is often heard over the consolidated area, but where the pneumonic process is widely distributed there will be an equally wide distribution and variety of râles, the sibilant and fine, moist mucous predominating. In certain areas the respiratory murmur may be scarcely discernible.

The breath sounds seem exaggerated, which is often largely due to the very thin chest walls in children. Bronchial breathing and bronchophony may also be present. On percussion one may obtain some idea of the degree and the extent of the lung involvement, its sounds varying all the way from normal to complete dulness. The temperature range is very irregular, some days being from 101° to 102°, and other days being from 103° to 104°. The pulse rate is usually between 140 and 160, and the respiration rate about 40. The latter, however, is frequently increased by an overdistended colon pushing up the diaphragm, particularly if the preceding illness had been of a gastrointestinal character. Both lungs are usually involved. The disease is not self-limiting, and will therefore frequently run for two or three weeks, finally terminating by lysis.

As to the complications of bronchopneumonia, the most common is otitis media. Emphysema is always present, and, in a small proportion of cases, pericarditis, meningitis, arthritis, and nephritis occur. Pleurisy also occurs fairly frequently. Empyema is comparatively rare as a complication of bronchopneumonia, being much more common after lobar.

The prognosis is always grave and the mortality is high, being estimated by some authors as fifty per cent. While the age and previous condition of the patient have some effect on the mortality, the height and character of the temperature during the attack is in no sense a guide in prognosis.

The treatment of bronchopneumonia is largely symptomatic, with special attention to the preservation of the patient's strength

[1]Read before the Philadelphia County Medical Society, January 26, 1916.

and upbuilding of his vitality, which is necessarily low when one considers the age of the patient and the fact that the pneumonia is following some other illness, which has probably seriously diminished his powers of resistance. A temperature of 65°, with plenty of fresh and frequently changed air, in the room, and a maximum amount of liquid nourishing diet to the point of digestive tolerance, are necessary, and a daily colonic irrigation, daily bath, and plenty of water are indispensable. Counter-irritation is often of considerable value, one of the best methods being the hot mustard application, which consists of adding a teaspoonful of mustard to a pint of hot water and applying to the chest a flannel soaked in this preparation, using it for twenty minutes at a time, three or four times a day. Dry-cupping and the application of hot camphorated oil are also of value. In view of the fact that otitis media is such a common and frequently serious complication, a frequent and thorough cleansing of the nose and throat is absolutely necessary. A cleaning out of the gastrointestinal tract at the beginning of the attack is also important, particularly if the pneumonia is secondary to some gastrointestinal trouble.

For the cough, inhalations are preferable to expectorant mixtures, so that the stomach may be saved for nourishment only, and the compound tincture of benzoin has given me good service. For the high temperature I have been in the habit of using hydrotherapy exclusively, and have been much pleased with the results obtained. Such young children stand the depressing effects of antipyretics very badly, especially in their weakened condition, and the hydrotherapeutic treatment seems to produce the desired effect without the drawbacks of drugs. Whenever the temperature is above 100°, an ice-bag is placed to the head and a hot-water bottle to the feet, the ice-bag being removed at the end of an hour and replaced at the end of another hour, and so on. Should the temperature reach 102°, a tepid sponge is given, using either plain water or water to which alcohol has been added. If the temperature continues to rise and reaches 104°, a colonic irrigation is given. Should the tepid sponge and colonic irrigations fail to control the temperature, the child is sponged with water at three different temperatures successively—first at 90°, then at 80°, and then at 70°, if necessary still further reducing the temperature to 60° or even 50°. The water used in the colonics may also be reduced to the same degree. In addition to these methods, much benefit has been derived from wrapping the hands and arms to the elbows and the feet and legs to the knees in wet cloths, covering them with a dry cloth and keeping them on for twenty minutes three or four times a day, the principle being the same as that of counter-irritation, viz., bleeding the child into its own vessels. These various methods are used on a four-hour basis during the day, and I have rarely found it necessary to use any other treatment for the high temperature where I have been able to get the hydrotherapeutic properly carried out. Believing that plenty of rest and sleep are essential to recovery, my pneumonia patients are never disturbed for any treatments after 7 P.M., but should they be awake advantage is taken of this fact to meet the indications then present.

As to stimulation, I feel this is frequently resorted to too early in the disease, the result being that the stomach is upset, and the artificial stimulation the child gets from the drugs is not to be compared to the natural stimulation to be derived from plenty of good, nourishing food well digested, which he probably would have been able to take had the digestive apparatus not been disarranged. When the heart needs assistance, it should surely be given, as would be the case if a very rapid pulse existed, or a soft, irregular pulse, in which case the tincture of strophanthus is the remedy of choice, using for a child under two years one or two drops in water every three hours. Another good remedy when the heart action is irregular and the pulse is soft and compressible is strychnine, in from 1/200 to 1/150 of a grain dose every three hours. In urgent cases these two remedies may be used together. Digitalis and alcohol

should rarely be resorted to in these cases. Should the child become markedly cyanosed, with cold extremities, nitroglycerin in 1/300-grain doses may be used, but should be stopped as soon as these symptoms disappear.

In my hospital cases I have been fortunate in being able to have them on a well-lighted and well-protected porch leading off from the ward, and the results have been most satisfactory.

I suppose I should at least make a reference to the bacterin treatment of pneumonia, of which, however, I have made but little use, owing to the great variability of the reports of those who have used it extensively and the equally great uncertainty of the dosage and the reaction in a weak, debilitated child. I do not feel that any case in which I have used the bacterin treatment with recovery would not have recovered without it, nor do I feel that any case which terminated fatally could have been saved by its use in the present state of bacterin therapy. Fifty million bacteria seems to be about the average initial dose, to be repeated according to the results obtained.

As to lobar pneumonia, I only wish to call attention to the symptoms of the onset as we see them in children in comparison with the adult. Lobar pneumonia is ushered in by high temperature oftener than any other disease of childhood, except scarlet fever. The onset is sudden, with high temperature, rapid respiration, vomiting, prostration, and abdominal pain. This pain, which is usually centered around the umbilicus, is believed to be due to diaphragmatic pleurisy. For the first twenty-four hours of an attack of lobar pneumonia there are neither pulmonary symptoms nor physical signs in the chest of the existence of a pulmonary condition. The chill which is usually present in the adult is rare in children, rigor seeming to take the place of the chill. Another important point in the onset of lobar pneumonia in children is that there is practically no cough or expectoration for the first two or three days in the majority of cases, and the differential diagnosis, therefore, of lobar pneumonia in children is rather between that and some abdominal condition than some other chest condition, at least for the first twenty-four hours. The one point which, from the moment of onset, despite the preponderance of abdominal symptoms, will stamp the case as a pulmonary condition, is the greatly increased respiratory rate. The disease usually attacks robust children in apparent good health; is self-limited; is characterized throughout the attack by a sustained temperature instead of the irregular temperature of bronchopneumonia, and terminates by crisis. Empyema is a frequent complication, and an important point to bear in mind is that there is no relation between the amount of fluid present and the amount of lung involved.

To refer for a moment to the present epidemic of pneumonia in Philadelphia, there are several points which, in my experience, are out of the ordinary, and explanations of which do not seem to be forthcoming. In the first place, there has been a large number of cases of lobar pneumonia occurring in children below the age when we expect to find it—that is to say, two years—and these cases have frequently been in weak, debilitated children instead of in the robust child as is usual. Then, too, there seems to be a greater tendency than usual for the diseased areas occurring in cases of bronchopneumonia to coalesce. In addition, I have been surprised at the number of cases of bronchopneumonia in which the temperature has been sustained throughout the attack, very similar to lobar, instead of being the irregular and moderate temperature which we usually have in broncho. One remarkable fact has struck me very forcibly in several cases of bronchopneumonia during the present epidemic, and that is the enormous excursions of temperature that have occurred in several cases between the hours of 7 P.M. and 7 A.M. Patients whose temperature would be from 103° to 105° during the day would rise to 106° or drop to 96°, or both, during the same night, and yet the child would not seem to be any

the worse for passing through this experience.

When it comes to advancing any reasons for these various peculiarities of the present epidemic, I am really at a loss to offer any satisfactory ones. It has been suggested that the suddenness of the development of the grippe epidemic this fall may have had something to do with it, and also the unusually warm weather that preceded and by spells has followed the grippe's arrival. It has occurred to me that probably the virulence of the epidemic itself may have had something to do with producing these unusual conditions. A number of my cases, however, did not follow grippe so far as could be learned. One might be disposed to view them as lobar, but if there is anything in the age, history of a previous illness, clinical symptoms, and physical signs, they were undoubtedly broncho. The only complication I have had was meningitis in a couple of cases, and these I had reason to believe were due to the lighting up of a latent tuberculosis, which was verified by lumbar puncture.

THE DIAGNOSIS AND TREATMENT OF PNEUMONIA.[1]

BY HOBART AMORY HARE, M.D.,

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Before taking up a consideration of pneumonia it is essential to define what we mean by this term. Consolidation of any part of the lung, whether it be due to the pneumococcus, the tubercle bacillus, or other cause, is in one sense pneumonia. In this paper, however, I shall not consider catarrhal, lobular, or bronchial pneumonia, because it has been covered by Dr. Mills, but croupous or lobar pneumonia in which there is hepatization of one or more lobes of the lung. The longer I practice the more I am convinced that both of these conditions are, in a great number of cases, terminal infections —that is, they strike down those who for the moment, or chronically, are suffering from some other disease or alcoholism. Bronchial pneumonia is a complicating lesion during the course of convalescence of many acute diseases, particularly in the case of children, and it also develops in the aged, who often are chronic sufferers from bronchial lesions and feebleness of the right heart. Croupous pneumonia strikes rarely on the child, often on the adult, and very often at the aged. Indeed, it may be said to be nature's method by which she removes from the list of the living those who have had their span of years. When I use the term "aged" I do not refer to those rich in years, for many men at forty or fifty are as old as others seventy or eighty.

In this communication I shall quote largely from my paper in Musser and Kelly's Treatment, because what I said in that book represents my views to-day. In that article I said "croupous or lobar pneumonia, the common manifestation of pneumococcic infection, is an acute infectious disease characterized anatomically by bacteremia and toxemia and a *local* inflammation in the lung progressing to consolidation. The designation pneumococcic infection is preferable to croupous or lobar pneumonia, chiefly for the reason that the inflammatory lesions in the lung may be the smallest part of the process going on in the body, and because the extent of the lung involvement has not much to do with the severity of the illness of the patient. It is important to bear in mind that the local lesions in the lung are accountable for some, but not for all, of the patient's symptoms; that the patient ill with croupous pneumonia is suffering from a general infection with the pneumococcus; that organs other than the lungs may harbor morbid lesions at least as well marked as the local pulmonary lesions; that in some cases these other lesions are susceptible of clinical recogni-

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tion; and that the severity of the clinical manifestations in a given case depends upon the virulence of the infecting pneumococcus and the resistance offered by the patient. The extent of the local lesions, be they in the lung or elsewhere, bears no necessary relation to the severity of the general symptoms, which, on the contrary, are an expression of the toxemia."

If every case of croupous pneumonia is to the physician merely an instance of consolidation of the lung, followed by death or resolution at the end of a week or ten days, then he will almost certainly fall into one of two errors. If his cases get well on a certain plan of treatment he will congratulate himself on his skill, and if a goodly proportion die he will suffer, according to his temperament, from more or less chagrin and doubt as to his therapeutic acumen. As a result he may fail to adhere to a plan which is based on sound sense, and he may turn to one less logical and not founded on experience. Whereas, if he recognizes the fact that in some of his cases the existing conditions are such that no plan of treatment can succeed, or at best can only do so by the most careful nursing, he will obtain a perspective or broad view of the course of the disease and the results of the treatment which will make clear the need of modification to suit the individual without impairing the general plan he has found to be the best. The physician in the latter case is like the mariner who, having worked out his course, finds it necessary to make minor changes because of wind and wave; whereas the physician who fails to gain a clear conception of the whole state of his patient, in each instance is so harassed by head winds and unexpected seas that he may find himself buffeted by conflicting factors to such an extent that he is soon sailing an uncharted sea without the compass of experience or the sextant of observation. It is largely because of these facts that so many plans of treatment of infections in general, and pneumonia in particular, are advanced. Each man in the face of a calamity has a plan of his own for escape, and some succeed by the aid of, or in spite of, nature, while others fail. It is by no means rare at a medical meeting to hear the treatment of croupous pneumonia discussed with minute detail as to drug and dose and no detail as to the age, state, general health, and vital resistance of the patient. The statement of drug and dose is useful, but it is of little real value unless we are told that the age of the patient was favorable or unfavorable, and unless we know, for example, that the kidneys and vascular system were or were not diseased, and that the patient was not addicted to alcohol.

It is important to remember that the physical signs, the actual lesions, and the course of the disease in both types of pneumonia, and particularly of the croupous type, are widely variant according to the state of the victim and the virulence of the invading organisms. Although from the etiological standpoint every case of pneumonia is identical, from the clinical standpoint one case is often as different from another as smallpox is from chicken-pox, for in one case the coccus is a cat, in another a tiger. These points are of value in discussing the diagnosis and treatment.

In all cases of true lobar pneumonia we are to bear in mind the fact that the patient is suffering from an acute, infectious disease which is quite as specific as is scarlet or typhoid fever, or diphtheria, and in the absence of a specific antitoxin we must recall the fact that we are not to attempt to treat the disease, or, for that matter, to attempt to treat the patient, with drugs, except when some definite assistance is demanded. Of this I shall speak later.

Concerning the diagnosis of both forms of pneumonia it is not necessary for me to reiterate the characteristic physical signs found in the text-books. The point I want to make is that the absence of these positive physical signs as a group often misleads the physician. Suspecting pneumonia he listens for fine râles or bronchial breathing. Not finding them he excludes pneumonia, when, as a matter of fact, these signs are absent because the exudate is too great for them

to occur. In other words, he should listen for silence as much as for sounds. In such cases percussion will often reveal dulness over a silent area, but even percussion may mislead one because a deep-seated consolidation may give hyper-resonance on light percussion over the area affected. Again, we may overlook a lesion if we do not auscult the axillary area, particularly if we do not uncover the lung by raising the scapula by placing the hand over the head with the elbow well abducted. In cases of cardiac disease the possibility of an infarct producing bloody sputum and physical signs must be recalled and unilateral pleural effusion must be excluded. The differentiation of effusion and pneumonia is easy in typical cases, and still easier in the text-books, but it is often one of the most difficult problems to solve in practice, every aid and sign being developed before the diagnosis is possible. Often the *x*-rays are the deciding factor.

In children I have noticed that a lesion at the apex is often associated with a fear of falling, so that the child clutches the mother as if it were about to drop off her lap.

Fever is, of course, of great diagnostic value, but in the old or feeble and in renal cases it may be very slight, and even absent in cases which are rapidly fatal. This holds true also in diabetes. The patient's resistive forces are absent. Like fever the white blood-cell count may prove misleading. A high leucocytosis is most suggestive, but a very slight increase in white cells may be present in the victim of age or disease or in those who are hard hit. So, too, the initial chill may vary from an intense rigor to a slight feeling of creepiness, and in the latter case a chill does not appear in the history. The point to emphasize is that croupous pneumonia may assault a man frankly, or attack him as insidiously as a sapper does his enemy in warfare.

The sputum may also vary greatly. In some cases it is glutinous and clear, in others glutinous and bloody, in others thin and bloody, as in cases of edema, and in still others it is very dark, like prune juice. In both the latter types it is ominous. It is well in this condition to recall the words of Sir William Jenner, "the brighter the blood, the less the weight, the better the prognosis." To which may be added, the higher the fever, the slower the pulse, the better the prognosis. And, again, I think it may be said that a large area of pulmonary involvement with bright sputum is better than a small, deep-seated lesion, so-called "core pneumonia," with little sputum. The only cases of hemoglobinuria in croupous pneumonia I have ever seen were met with in patients with a deeply seated small lesion.

As to the treatment of croupous pneumonia, I do not think I am guilty of excessive language when I say, "For God's sake let them get well." Do no harm. Let nature's laboratory make the needed drugs. Do not make the patient strive to be a victor over disease and medicine. No one can see the treatment of many of these cases, and, if they get well, fail to exclaim after seeing the number of drugs used, "What a wonderful constitution the patient has." The point is not to try to treat the pneumonia.

Dean Swift saw a child stroke the back of a tortoise, and was told it was done to please the tortoise. He replied, "You might as well stroke the dome of St. Paul's cathedral in an endeavor to please the dean and chapter." This story may be applied to the use of those remnants of barbarism, cotton jackets and poultices. How any one can see a hepatized lung and then think that a poultice on the chest is going to do anything else than harm the patient I cannot understand. There is not a man in this room who could tolerate a hot poultice all around his chest as long as it takes me to read this paper. There would be a demand for more air because the poultice oppressed him, although he has two good lungs and a healthy heart. If a hepatized lung is the local lesion resulting from a general infection, why should we poultice the chest in pneumonia any more than we would paint the abdomen with nitrate of silver to treat the intestinal ulcers in typhoid fever.

There are certain remedies in this disease which, although they have been frequently employed, are without doubt contraindicated in all instances. I refer to the coal-tar antipyretics. There is a large amount of evidence that fever is a protective process, or is indissolubly connected with the protective processes. It often is a most valuable sign-board in directing us as to what we shall do for the patient, and the physician who wipes out fever in the pneumonic patient by the use of antipyretic drugs is like the man who knocks down the sign-board on the road he travels. Fever is not harmful, and antipyretics are useless. Except in cases of distinct hyperpyrexia, where the temperature remains above 105° for a long period, even cold sponging is, as a rule, to be avoided, for the patient will not react. On the other hand, there is an agent which tends to lower temperature and permit oxidation which, I believe, is as near a specific remedy as any that we have, namely, cold, fresh air. When William Perry Northrup of New York instituted this method of treating pneumonia a great advance in our method of dealing with this disease came about. No matter how carefully a room is ventilated, the mere heating of the air of the room to an ordinary living temperature seems to devitalize it to the pneumonia patient, and cold, fresh air diminishes the lividity and cyanosis with remarkable speed if there is enough lung left to carry on oxidation. I have frequently seen a patient, brought in from the pneumonia roof ward in excellent condition, become distinctly livid and markedly worse within ten or fifteen minutes, and equally rapidly improve when once more put in the fresh air. I would rather have this method of treating croupous pneumonia than any drug with which I am familiar. It is hard on the nurses, but it is life to the patient.

Another mistake which is frequently made is to treat symptoms without any good reason for treating them, simply because the symptoms are not in accord with the normal state. Any attempt to force the pulse, the respiration, or the temperature to the normal line is futile and dangerous. It is just as natural for variations to occur in these functions in disease as it is for a ship to go up and down in a storm, and the landsman who attempts to make the ship rest on an even keel in a storm by opening her seacocks and flooding her hold with water is not more insane than the doctor who tries to make nature fit into his way of thinking. Some persons when treating pneumonic patients seem to be like a Filipino suffering from the running amok, who shoots with everything he can lay his hands on at everything in sight.

It must not be thought from what I have said that in the treatment of pneumonia I am a therapeutic nihilist, or an advocate of "peace at any price." On the contrary, when any symptom, or series of symptoms, becomes so widely separated from normal function as to be dangerous in itself, or to indicate the approach of danger, it should be curbed and curbed fearlessly. The function of the physician is to determine with nicety these facts. If one drug in a given dose is useful in all cases the patient needs a druggist, not a doctor.

Time does not permit me to go into an intimate discussion of the exact conditions which indicate different remedies. I can only say that, as the result of a pretty large experience, I believe the administration of 10 drops of tincture of belladonna three to four times in the course of each twenty-four hours throughout the greater and particularly during the latter part of an attack of croupous pneumonia tends to prevent complications in the vascular apparatus, and that atropine and strychnine are to be kept in reserve to be used in full dose to meet any threatening of collapse. Alcohol in the form of a good whisky is often exceedingly valuable in those of advanced years and in those who have been accustomed to its use. In certain cases in which there is great cyanosis in plethoric individuals, free venesection is sometimes advantageous. If heart-clot is the cause of the cyanosis, of course it can do no good, but if the right ventricle is distended it may afford necessary relief.

So, too, if there is grave toxemia, it is questionable as to whether venesection will do good.

There are other points to which I would like to address attention. Gibson of Edinburgh and myself have written a number of papers pointing out that any approximation of the systolic pressure in millimeters of mercury with the number of beats per minute of the heart is indicative of approaching danger. I believe this is true in adults, although not an invariable rule. It is of no value in children. More important is it to estimate the difference between the diastolic and systolic pressure: thus, if the diastolic pressure is low, it is evident that remedies which will raise blood-pressure or influence the blood-vessels directly, or indirectly, are indicated, particularly if the systolic pressure is high, indicating that the heart muscle is strong. Thus a diastolic pressure of 60 with a systolic pressure of 150 shows that there is relaxed vascular tone, but a powerful heart stroke, and cardiac stimulants are not needed; whereas a diastolic pressure of 70 and a systolic pressure of 110 may indicate in certain cases that both vascular and cardiac stimulation is essential.

The second point which I wish to emphasize is the error of writing prescriptions for a pneumonia patient and having them continued for days at a stretch. With the possible exception of belladonna, which is used to prevent vascular complications from suddenly arising, I have never seen any case of pneumonia which needed the same remedy, in the same dose, day after day. The skilled physician will fit his drug and his dose to the needs of his patient at each visit, for, like a captain of a ship, he cannot control the storm but only handle his vessel. The captain of a ship who leaves the bridge with written orders to the helmsman at 10 o'clock in the morning and does not appear on deck again for twenty-four hours is courting disaster. The doctor who tells a nurse to use full doses of active remedies every few hours for the next twenty-four hours or for days is almost equally courting disaster. If the man needs stimulation he needs it actively in one or two doses. He rarely needs it again and again and again, unless he is in such a desperate state that the physician should stand by him to reach an accurate estimation of his condition from hour to hour. In other words, when a small boy is trying to climb a tree, boost him when he needs to be boosted, get under him if he slips so dangerously that he seems about to fall, but don't shove him so hard and so constantly that he pitches over on his head and cracks his skull. He badly needs help occasionally, but not all the time. A few good-sized doses of digitalis are often wise, but its persistent use is usually unwise.

I quote again from my paper in Musser and Kelly's Treatment:

"The proposition as to the circulation is not 'it must be stimulated,' but rather 'does it really need stimulation?' and if so, how much is needful? In order to determine what is really needed the physician must find if the first sound of the heart possesses its normal tone and if the apex-beat is normally forcible and in the proper place, and he must allow for the presence of the fever and illness as a natural cause of perversion of function, and not as a manifestation that the heart is seriously impaired. He must listen with care at the third left costal cartilage to discover if accentuation of the pulmonary second sound indicates an abnormally high pressure in the pulmonary artery, threatening failure of the right heart, and he must listen to the aortic sound to discover if the fever, or other cause, has produced such a state of arterial pressure that the left ventricle is called upon to do too much labor. Finally, his fingers upon the pulse and the use of the sphygmomanometer must give him additional information as to arterial tension, pulse force, and pulse rhythm. If the results of all these tests is the discovery that nothing evil exists, let the medical attendant carefully eschew the use of drugs. If, on the other hand, he finds that the first sound of the heart lacks quality, he is called upon to use a stimulant, and he must determine which is most needed. The need of a stimulant becomes still more emphatic if the secondary pul-

monary sound is accentuated and if the pulse is arrhythmic or if it misses beats. The choice of the drug depends in part upon the age of the patient, his general vitality, and, very important, the stage of the illness and the duration of the evil symptoms. In the aged, if the arterial tension is not too high, digitalis is often useful, giving it often in small, divided doses to avoid irritating the stomach; or, in its place, one of the alcoholic stimulants is often needful. The latter are absolutely essential if there is a history of the free use of this form of stimulation before the illness. These remedies may be needed in elderly patients, but they are less and less necessary as youthfulness exists, and it is often the case that the skilful physician can, by the use of some rapidly acting diffusible stimulant, give such support to the circulation that he may bridge over a temporary distress and get his patient into 'smooth water on the other side of the reef,' where he may progress without any further use of drugs unless he gets in some acute difficulty a second time."

Digitalis acts too slowly in many urgent cases to do any good while aid is needed. In a great emergency strophanthin may be given intravenously, or the American preparation strophanthone may be used intravenously or hypodermically. It is an efficient cardiac stimulant. There is surely no more reprehensible practice than the ordering of large quantities of medicine to be taken day after day in pneumonia as a matter of routine.

Morphine will often save life when prolonged sleeplessness or constant tossing threatens to exhaust the patient.

"I have, on a number of occasions, called attention to what I believe is the very general abuse of strychnine as a circulatory stimulant. It is, without doubt, the custom of a large number of practitioners to rely upon strychnine as a stimulant to the heart during the course of the acute infectious diseases, and not only to give it for a few days at a time, but to continue its administration day by day and even week by week, with the result that the patient may be benefited during the earlier part of its administration, but soon fails to develop any good effects from its use, and, on the contrary, suffers from a condition of circulatory and nervous irritability which is often taken for a manifestation of the disease. There can be no doubt that full or even massive doses of strychnine are exceedingly valuable in their effects in cases of acute circulatory failure, and even in many cases of subacute circulatory failure such doses may not only improve the patient's condition, but actually save life, it being the consensus of opinion among medical men that massive doses of strychnine are very certainly life-savers when cardiac failure is threatened.

"Much misunderstanding of the proper use of nitroglycerin exists. I have repeatedly pointed out that the very common employment of nitroglycerin by the profession as a circulatory stimulant is based upon an erroneous conception of its physiologic action, and when good results have followed its administration in cases of cardiac failure, which are not due to high arterial tension, the physician has given credit to the nitroglycerin, when, in reality, the credit should be given to the recuperative powers of the patient. It is not conceivable that nitroglycerin can be of benefit by lowering the arterial tension of a patient whose blood-vessels are naturally elastic and whose blood-pressure is practically normal or below normal, yet, as I write this article, I read the opinion of a well-known specialist in diseases of children, who advises the use of nitroglycerin in infants who may be suffering from circulatory embarrassment due to pneumonia. It is quite true that in some of these cases when the skin is hot and dry and the administration of a drug which will relax it and produce mild diaphoresis is followed by good results, but the good effects which follow this plan of treatment are due to the equalization of the circulation in various portions of the body, and do not depend upon any stimulant effect upon the circulatory or nervous system. Sweet spirit of nitre, which has a physiological action closely allied to nitroglycerin, is sometimes a better remedy than the more powerful

drug, nitroglycerin, if any vascular relaxant is needed."*

Expectorants in either type of pneumonia are never useful until the stage of resolution is well developed, if then. They cannot do good and they upset the stomach. There is nothing to spit up. Resolution takes place by the development of autolytic substances, and we cannot hurry it.

I wish to sound a note of warning against the use of iodides in cases of delayed resolution. The processes of nature are best suited to the removal of the exudate in the vesicles of the lung. The iodides may hurry these unduly, and may in the general process cause an absorption of some old inflammatory mass which has walled off and rendered innocuous an old tuberculous deposit. In cases in which delayed resolution is present, and the physician is tempted to hurry it by the use of the iodide, he too often finds that the delay is not due to the remains of a frank pneumonia, but is the result of a terminal or coincident infection by other organisms, and the officious interference of the physician when nature is endeavoring to produce good results may be followed by disaster. In many instances so-called delayed resolution is really an empyema or an interlobar empyema.

The problems in a given case are as follows:

1. Has the patient croupous pneumonia?
2. If so, what is his general state?
3. Are the heart, kidneys, and vessels primarily diseased?
4. Does he need any other treatment than rest in bed and good nursing?
5. If so, what does he, that individual, need?
6. Does he need stimulation, sedation, elimination?
7. If he needs stimulation does he require it right along, or only at the moment? When we eat we don't eat all the time for days, but only when we need food.
8. As to all drugs follow Cromwell's motto, "Trust in God, but keep your powder dry." Don't shoot all the time, but follow Warren's advice at Bunker Hill, "Hold your fire until it will be surely effective," and then use the remedies needed fearlessly, and all the more advantageously because they have not been used before.

AURAL COMPLICATIONS OF INFLUENZA.[1]

BY S. MACCUEN SMITH, M.D.,
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Influenza has been recognized and treated as such for ages, the epidemics having always been characterized by intervening periods during which the disease seems to have been banished from the face of the earth. There have been periods of such complete cessation of this disease that many physicians of the past knew nothing of its nature from clinical experience. From the time of the notable epidemic of 1888, which in an incredibly brief time became pandemic, spreading over the entire civilized world, we have not only learned much as to its true nature, but have come to look upon the advent of epidemic influenza with serious apprehension, not so much, perhaps, from the fact that influenza, *per se*, seriously endangers life, but chiefly from the knowledge of the grave complications and numerous deaths that invariably result from local complications. It is with one of these complications, as manifested in the organ of hearing, that this paper chiefly treats.

With possibly one exception, we are at present unable to draw a clinical picture characteristic of the changes in the upper air-passages chargeable directly to the specific action of the bacillus of influenza. There can be no doubt, however, that the inflammatory changes are distinguished for their intensity, rapidity, and virulence of action, frequently involving the tympanic and adjacent cavities in a serious suppurative process quite unusual in any other

* Musser and Kelly's "Treatment."

[1] Read before the Northern Medical Association of Philadelphia, January 28, 1916.

infectious disease. The exception above referred to is that known as hemorrhagic otitis, which is by many believed to be *the* distinguishing feature of otitic influenza. Although this hemorrhagic tendency may not be wholly diagnostic of the severe inflammatory ravages involving the mucous membrane generally, still there can be no doubt that hemorrhage does occur from the membrana tympani, tympanic cavity, throat and lower respiratory tract, as well as from the gastrointestinal, genito-urinary, and possibly other internal organs.

I feel that the gravity of this disease, in its broadest sense, is not yet wholly comprehended by the medical profession. This statement finds its justification when we realize that more human lives have been lost in one influenza epidemic than were sacrificed in many of the former great wars of the world, or the plagues of ancient days.

The initial observable inflammatory process in otitic influenza is a severe myringitis, hemorrhagic in character, with the formation of bluish-red extravasations, at times coalescing and forming large, dark-colored bullæ, which, as Politzer has pointed out, usually collapse and discharge a bloody, serous fluid before rupture of the membrana tympani occurs. Areas of ecchymosis are also seen on the walls of the external canal. Maceration and consequent peeling off of the mucous lining of the tympanum is much more rapid and extensive than when caused by other virulent disease.

Mastoid implication or irritation is present in all *severe* cases, the percentage of patients requiring operative interference being unusually large. In a few of these the mastoid becomes involved simultaneously with the middle ear.

In attacks of acute otitis media resulting from the more ordinary causes, the pain is alleviated when the confined fluid is given free escape. In a goodly number of cases of influenza otitis, however, the suffering frequently continues for a day or two, with little or no abatement. This is especially marked when spontaneous rupture has occurred in place of a timely free incision of the overdistended membrana tympani.

Another group of cases is characterized principally by the absence of actual suffering, together with early spontaneous rupture of the membrana tympani. These cases are particularly interesting from the fact that, even in the absence of the usual symptoms, the mastoid and other adjacent structures are frequently involved. This latter class of cases emphasizes the need of expert care in order to prevent, if possible, the development of meningitis and other complications which are not suspected until grave symptoms of their actual presence become manifest, and which are, unfortunately, so common in children.

In addition to the special predilection for mastoid complication, meningitis, and lateral sinus thrombosis, intracranial and extradural abscess formations are encountered more frequently with each succeeding epidemic. The discharge, at first bloody, soon changes to that seen in ordinary cases of tympanic suppuration, with which all are familiar.

Demonstrating the presence of the bacillus of influenza is a matter of importance. However, within a short time the discharge from the tympanic cavity develops a mixed infection, such as the streptococcus, staphylococcus, pneumococcus, etc., thus often supplanting the original germs of infection. It is, nevertheless, of the greatest value to have a bacteriological examination of all discharges from the ear, as most useful information, even of vital import, is frequently disclosed. Curiously enough, during the recent epidemic, an examination of aural discharge seldom revealed the presence of the bacillus of influenza. The predominating organisms were the pneumococcus, streptococcus and staphylococcus, and, in some instances, where the discharge was taken directly from the mastoid process and had not been exposed to the air, a pure pneumococcic infection was revealed, this notwithstanding the fact that all of the cases had been treated by the attending physicians as typical attacks of epidemic influenza.

The method of infecting the middle ear and adjacent structures is either by direct continuity of structure, the organisms enter-

ing the tympanum through the Eustachian tube, or being conveyed by means of the blood-vessels and lymphatics; and you may be assured that with the same facility with which the bacilli of influenza find their way into the bronchi or deeper respiratory tract, producing a catarrhal or more serious complication; or into the gastrointestinal canal, with the attendant, and I might say characteristic, diarrhea; or into the nervous and circulatory systems, producing the train of serious neurotic phenomena familiar to us all; or into the genito-urinary tract, causing a functional or structural disturbance of more or less gravity—with even greater facility, I repeat, do these pathogenic bacteria invade the cavities of the skull, frequently destroying the function of a part, or even leading to a fatal issue.

The records of numerous cases furnished me by the attending physicians, nearly all of which cases I saw in consultation, teach an impressive lesson. I shall not burden you with details of these cases, but will merely point out a few general characteristics. About one-third of the number were distinctly hemorrhagic in type. In slightly more than one-half, the membrana tympani ruptured spontaneously within forty-two hours. The pain, mastoid symptoms, and fever, however, continued for from twenty-four to sixty hours after apparently free drainage had been established. In about one-fourth of the cases the membrane was freely incised before the point of spontaneous rupture was reached, and in each of these cases the pain was promptly relieved, as well as the temperature and all mastoid symptoms; while about two-thirds of those in whom spontaneous rupture occurred required operative intervention. In addition to mastoid empyema, meningitis developed in two patients before resort was had to operative interference.

As regards treatment, and especially prophylaxis, I have but little to add to that familiar to you all. However, I wish to lay particular emphasis on a few points. Aural complications, to be treated successfully, must be dealt with in a bold but not necessarily non-conservative manner from the very inception of the attack. Absolute rest in bed, with free diuresis and properly conducted diaphoresis, is of the first importance. The bowels should be freely opened and the diet restricted to milk and broth. Indeed, two or three days of absolute fasting and enforced rest in bed will frequently accomplish more in prophylaxis than any other combined therapeutic measures.

The first signs of aural involvement should receive prompt and energetic care. Influenza earache of the severe type will seldom yield to hot drops or applications, although, if seen at its inception, a hot boracic acid solution or a five- or ten-per-cent carbolic acid in glycerin solution instilled into the canal will do no harm and may be somewhat palliative. It should be remembered that the external layer of the membrana tympani is composed of modified skin, and is influenced but little, if any, by medicated solutions. Hot antiseptic solutions are most useful in many acute cases of otitis; hot medicated solutions are also useful, almost wholly, however, from the effect of the *heat*, and not from the medicaments they contain. Solutions of cocaine, belladonna and opium, etc., cannot be depended upon, therefore, for the relief of acute ear pain, except from the calorific action.

Bloodletting in front of the tragus is of service in most acute inflammatory diseases of the middle ear, but must be employed at the beginning of the attack to be beneficial. The ear should be frequently examined with a speculum and reflected light, to insure a prompt free incision of the membrane the moment any distention is seen. It is unwise to wait for a marked distention of the membrane in influenza otitis, as resolution seldom takes place in severe cases, whereas it is this delay that favors mastoid and intracranial complications. The more the distention, the greater the destruction to the soft parts and consequent involvement of the osseous structure. Under proper precautions an incision, and a free one at that, of the membrana tympani can do no possible harm, whereas a failure to promptly incise the membrane has been the one most prolific cause of serious complications. The

cause of conservatism is best served, therefore, by an early incision and complete evacuation of the fluid.

It must be kept in mind that the two essential elements for the rapid development and multiplication of bacteria are heat and moisture. The treatment of many cases, therefore, must be directed to meet or correct these elements, as the site of suppurative otitis media is a veritable hot-bed for the propagation of disease germs. Our chief object, then, in such cases is the application of therapeutic measures to rid the ear, as far as possible, of these bacteria, and endeavor to inhibit their further development by the destruction of the pabulum of their existence through the reduction of inflammatory heat and by keeping the propagatory surface dry.

If the discharge is profuse, irrigation or syringing with antiseptic solutions becomes necessary. One of the best for this purpose in influenza otitis is a 1:2000 permanganate of potassium solution. This can be alternated to advantage with a 1:6000 bichloride of mercury solution. Iodine in a one-per-cent solution is also serviceable. As the discharge lessens in quantity, syringing or irrigation should correspondingly decrease, and should be entirely suspended as soon as the decrease in discharge will permit; in other words, a continuation of syringing will frequently prolong a discharge, as explained in the preceding paragraph.

It is best, therefore, in those cases in which the discharge is not particularly copious, or in which it has markedly decreased under the wet method of treatment, to use the dry method of treatment, which consists in cleansing the canal with cotton on an applicator, and dusting the surface with impalpable boric acid powder or a powder composed of equal parts of boric acid and oxide of zinc. Aristol acts favorably in some cases.

In all severe acute suppurative diseases of the middle ear, the mastoid is more or less involved. In those complicating influenza, a much larger percentage develop into suppurative mastoiditis that requires operative intervention than from other causes. It is well, therefore, to keep in mind the fact that an otorrhea which is unduly prolonged has its origin in the mastoid cavity and is not prone to result in a spontaneous cure.

THE USE OF LUTEUM EXTRACT IN THE TREATMENT OF MENSTRUAL DISORDERS.

LEIGHTON, in the *American Journal of Obstetrics* for November, 1915, says he is certain that there are cases of dysmenorrhea in which the main causal factor is deficient action of the natural corpus luteum. He is not carried away with the idea that the therapy of corpus luteum is a "cure-all" in any sense of the word; on the other hand, the cases which may be traced to ovarian deficiency are probably in the distinct minority. One must not allow himself to be so impressed with the etiological value of some one factor in the cause of disease that he forgets, or becomes indifferent to, other factors of equal importance.

Surgery is necessarily indicated in those cases in which we find pelvic pathological conditions or anatomical abnormalities, which we are wont to consider as the probable causes of dysmenorrhea. Too often, however, do we resort to operation and, consequently, too often are we disappointed in the results, because the defect is not surgical but glandular. Again, more often than one would think, is organotherapy indicated in conjunction with surgical intervention.

There are some serious drawbacks to the use of corpus luteum. It generally has to be used routinely or continuously to obtain and to maintain results. Its cost hinders its more frequent administration. Its action is not immediate, it is cumulative; for that reason patients, and we ourselves, too often discard its use after a short trial, if it has been unproductive of good results.

As regards its dosage, the writer finds that from 15 to 20 grains a day, seldom more, is sufficient in any case. Its prolonged administration has not brought about any untoward symptoms in his cases, with, perhaps, the possible exception of slight gastric disturbance in one or two instances.

EDITORIAL.

GERM INFECTION AND VACCINE THERAPY.

We think that it may be stated without much danger of contradiction that so-called vaccine therapy has not proved as successful as it was thought it would be soon after it was introduced. After the enthusiasm born of its novelty had passed away it became increasingly evident that there were a number of factors which prevented it from being universally applied. One of these was the practical impossibility of determining the reactive power of the individual by measuring his opsonic index. Another difficulty has been to obtain a stock vaccine in which the strain of the pathogenic organism is identical with the strain which is infecting the patient, and, in acute illness, the time does not exist in which an autogenous vaccine can be made. Without doubt many cases which are treated by stock vaccines give advantageous results, but, oftentimes, in instances where the conditions are most urgent and where life is to be saved, rather than discomfort put aside, they entirely fail. Furthermore, the administration of any vaccine in too large a dose exercises a deleterious influence upon the patient, and the question as to what is too large a dose necessarily varies in each individual. Thus, a dose of a given organism which is perfectly proper in a case of furunculosis may be absolutely harmful to an individual whose vitality and reactive power is so impaired that he cannot respond to the treatment.

Three papers have appeared upon this subject very recently which seem to have an important bearing. One of them, by Rosenow, in the *Journal of the American Medical Association* of November 13, 1915, seems to prove very conclusively that organisms obtained from certain tissues possess the characteristics of having an affinity for similar tissues in other animals, or in human beings. Thus, he found that 14 strains of streptococci from a case of appendicitis produced lesions in the appendix of 68 per cent of the animals injected, whereas only 5 per cent of the animals injected with strains of streptococci obtained from other sources than cases of appendicitis suffered from a localization of the organisms in this part of the body. Similar results were obtained from streptococci taken from cases of cholecystitis, for they caused a similar lesion in 80 per cent of 41 animals injected, in contrast to an average of 11 per cent locally infected when injected with other strains obtained from parts of the body widely separated from the gall-bladder. These percentages practically hold good in regard to most, if not all, of the organisms which he obtained and studied. Thus, it is interesting to note that eight strains of streptococcus viridans, from chronic septic endocarditis, produced lesions in the endocardium of 88 per cent of the 44 animals injected, in contrast to an average of 15 per cent when the strains came from other lesions than those of the endocardium.

These experimental results of Rosenow, fortified by the researches of many others, are supported by a summarization of the literature presented by Hulst in the *Long Island Medical Journal* for November, 1915. Hulst in his paper shows, to use his words, that "bacteria are able to acquire new characteristics. In other words, some species at least are not stable, but change their metabolic processes to meet their environment. If variation occurs under the influence of weak chemical solution, salt concentration, oxygen tension, and symbiosis with other organisms, it is reasonable to presume that similar changes may occur in the body in the course of infections where environment is also variable to the parasite. Such phenomena have been observed; *e.g.*, the streptococcus obtained in puerperal sepsis may differ from that obtained from a metastatic abscess from the same case. Also cultures in pneumonia and otitis media suggest a transformation *in vivo* of streptococcus mucosus and of pneumococcus into hemolytic streptococcus.

"The selective action which organisms display toward certain tissues of the body may be acquired within the body to a certain extent. If there are alterations in the constitution of the parasite depending upon the conditions existing at the point of infection, this fact may determine the nature which the disease may assume as much as the parasite itself. Just what characteristics of bacteria control the affinities for various structures is not explained, but such affinities exist as well-marked phenomena, and bacteria undergoing experimental mutations show different affinities at different stages of their transformation."

In other words, it becomes evident from Rosenow's research, and Hulst's summary, that we not only have to deal with different strains of microörganisms belonging to the same family, but that we have to deal with alterations in pathogenic power induced by the conditions or peculiarities of the part in which the germ has grown, and this is possibly one of the reasons why autogenous vaccines have proved to be so much more efficacious than stock vaccines. It may also explain why so-called mixed vaccines have succeeded, for, although they have been generally condemned by bacteriologists, it is possible that when a mixed vaccine is used certain strains possessing the peculiarities of the organisms inducing the lesion in the patient may be efficacious while the associated strains are not.

Closely associated with this matter is the question as to the relative value of ordinary vaccines and sensitized vaccines, either as prophylactic or curative agents. It will be recalled that a sensitized vaccine is one in which the specific microörganism of an infection is brought in contact with the blood serum of an animal which has been infected by such an organism. In other words, the vaccine has been brought in contact with the antitoxin of this serum. If an ordinary vaccine is used it is necessary for the tissues of the body to provide the amboceptor by which the complement that already exists in the cells or juices can be linked to the bacteria. Therefore, when a so-called sensitized vaccine is employed this function of providing an amboceptor on the part of the tissues is avoided, and the vaccine which is injected can immediately proceed in developing the process of phagocytosis and, indirectly in some instances, aid in the development of antibodies.

In a research carried out by Schottstaedt (*Journal of the American Medical Association*, Nov. 13, 1915), the details of which it is not necessary to give here, in connection with typhoid infection, he studied the influence of non-sensitized vaccine killed by the addition of 0.6 per cent phenol; non-sensitized vaccine killed by 56° Centigrade; standardized 0.4 per cent killed by phenol; non-sensitized washed vaccine; and two types of sensitized vaccine.

He found that none of these products produced a negative phase in the opsonic activity. There was a slight reaction following the injection of non-sensitized vaccines, which was absent when sensitized vaccines were employed. Vaccines killed by heat seemed to be less active than those killed by phenol. He also found that the injection of these vaccines seemed to increase the opsonins more quickly than the agglutinins or the bacteriocidins, and that the opsonins and bacteriocidins are more persistent than the agglutinins, but he believes that the immunity is more likely due to the former than to the agglutinins.

By far the most important part of his observations, from the standpoint of the practicing physician, is his statement that sensitized vaccines are less potent than non-sensitized vaccines, which he thinks is due to the bacteria of the sensitized vaccines undergoing phagocytosis and bacteriolysis more rapidly. It would seem that this argument would work the other way, since the rapid destruction of the injected organisms, by setting free their toxic content, might be supposed to stimulate the protective processes.

Finally, Schottstaedt concludes that when it is the wish of the physician to confer a prolonged immunity, as in the prophylaxis against typhoid fever, it is better for him to employ non-sensitized vaccines, whereas in instances in which a quick response of the

protective powers is desired, as in typhoid fever which is already developed, sensitized vaccines are to be preferred.

COLLAPSE IN THE ACUTE INFECTIOUS DISEASES.

The sudden development of collapse in the course of the acute infectious diseases is a condition which is familiar to all practitioners of experience, and is universally dreaded because of its sudden onset and its grave danger. Against this onset many physicians attempt to guard their patients by the continual administration of stimulants and thereby overstimulate, calling upon the reserves of the body and expending them when they should be kept in reserve for critical periods.

It is interesting to note, as in so many other instances in medicine, that practical experience has developed the use of certain remedies to combat such collapse before the physiological or pathological processes responsible for it were understood. For many years physicians have been prone to use strychnine and, more than strychnine, atropine to combat this condition when it was threatened or present, and this long before it was recognized that atropine contracts the blood-vessels in the splanchnic area while tending to dilate the blood-vessels upon the peripheral portions of the body.

Two researches have appeared during the last two years which are interesting in this connection. One of them was made by Porter and Pratt, whose investigations seem to show that it is not the vasomotor center which is depressed by diphtheria toxin, thereby resulting in collapse through vascular relaxation. The other research is that of Meyers and Wallace, who found that the walls of the vessels themselves did not seriously suffer from the poison of diphtheria. They found that it seriously attacked the epithelium of the intestines, the capillaries in the liver, and that there is great congestion in the arteries in the abdominal organs, particularly an engorgement of the mesenteric vessels; in other words, great relaxation of the blood-vessels in the splanchnic area.

No one supposes for a moment that any drug is capable of restoring cells or tissues which have undergone actual destruction, and in such a case death may be inevitable; where, however, there is impairment of function it would seem that the use of atropine, to which we have referred as having been used empirically, has a scientific basis for its use.

VARIOUS METHODS OF TREATING PLEURAL EFFUSION.

It is indicative of the conservatism which governs medical men that most of them still resort to the vacuum bottle and aspirating apparatus in the treatment of pleural effusion. It is also illustrative of steadfast adherence to custom that in the belief of many every case of empyema should not only be opened and drained, but that it is essential that a piece of rib shall be excised. There can be little doubt that these two methods of practice are often correct, and the latter is doubtless the best plan to pursue in the majority of cases. Much depends, however, upon how long the empyema has been present, how closely the ribs are approximated, how old the patient is, and the cause, that is to say, the pathogenic organism, which has induced the trouble. Certainly in pneumococcus empyema occurring in children an incision between the ribs and the introduction of a double drainage-tube produces results which are quite adequate without the necessity of performing what is practically a major operation if the rib is to be excised under a general anesthetic; for the administration of a general anesthetic in the presence of a large effusion in the chest greatly increases the danger. The point is to see that drainage is adequate, and this can be aided by inserting the drainage-tube at a low point in the chest, by the maintenance of proper postures, and by gradual thoracic exercises in which the displacement of fluid from one Wolfe bottle to another is practiced several times a day. Where the effusion is in very large amounts we have

repeatedly expressed our belief that enough of it should be drained off by aspirating to permit the thoracic organs to gradually adjust themselves to the relieved pressure, since the sudden evacuation of a large effusion by means of the knife produces changes in the thoracic organs which are by no means devoid of danger.

When the fluid in the chest is not purulent we have come to the conclusion that the employment of the vacuum bottle is rarely needed. It is quite sufficient in many instances to attach a large-caliber needle to a piece of rubber tubing into the other end of which is fixed a funnel. Water, or a normal salt solution, is then poured into this funnel until all air is displaced from the tube. The needle then is introduced into the chest, and the funnel end of the tube, which has been held well above the patient's chest, now well filled with liquid, is lowered. The chest is by this means readily emptied by a process of siphonage and without the use of cumbersome apparatus. If the effusion is a transudate, all that is necessary to remove it is this means.

The most common cause of a transudate when on one side of the chest is probably cardiac disease, and, as is well known, the right side of the chest is the one upon which the effusion most frequently occurs. If the effusion be an exudate—that is, the result of an inflammatory process—it will be found that the fluid, when withdrawn by means of an aspirating syringe, used to determine positively that fluid is present, contains more albumin and has a specific gravity above 1018, whereas a transudate has a specific gravity often not greater than 1006. If a few drops of the fluid which has been withdrawn are dropped into a solution of glacial acetic acid of the strength of two drops to three and a half ounces of water, and a light, curling cloud of albumin follows the drops as they pass through the acidulated liquid, the fluid is an exudate. This does not take place when a transudate is added to the acetic acid solution.

It is usually held that pleural effusions which are not purulent require tapping only when they are large enough to interfere with respiration, or with other important functions, by pressure.

The tendency on the part of exudates to recur has been treated within the last few years by what is known as autoserotherapy. Gilbert first advanced this method in 1894, the idea being that through it some ferment substance activates the processes by which fluid is absorbed. The method consists in drawing from the pleural cavity by means of a glass syringe, attached to a suitable needle, some of the fluid which is in the chest. By drawing on the piston of the syringe it is easy to determine when 5 or 10 Cc. of fluid has been obtained. The needle, still attached to the syringe, is then partly withdrawn until the opening in the end of the needle is in the tissues of the chest wall and not in the pleural cavity. In some instances it is well to draw the point of the needle to the inner surface of the skin, and then, after deflecting it, to push it into adjacent tissues, avoiding going so deep as to puncture the parietal layer of the pleura. The fluid in the syringe is then injected into these tissues and allowed to remain there.

It is claimed that if this method is carried out under proper aseptic precaution no local or general untoward effects ensue. Indeed, in many instances it has been found that absorption of the original fluid takes place without the chest having been first evacuated by the methods we have described. Of course, it must be recalled that all physicians of experience have met with patients in whom the mere introduction of a needle and the withdrawal of a small amount of fluid has resulted in the system of the patient withdrawing the balance by absorption. Whether this is due to the fact that a few drops of the fluid enter the subcutaneous tissues as the needle is withdrawn, and thereby the physician practices involuntary autoserotherapy, has yet to be decided. The method certainly commends itself in those cases in which the patient for various reasons may be so weak and feeble that aspiration of the liquid by ordinary methods is regarded with anxiety. A considerable lit-

erature on this subject has now accumulated, and the method would seem to deserve further trial.

THE TRUE POSITION OF ADRENALIN.

Many years ago when adrenalin first appeared we called attention to the fact that it was impossible for any remedy to possess power for good without, at the same time, possessing power for harm, if it was used ignorantly or unwisely. This is true of every drug. It is inconceivable that anything which is physiologically active when properly applied shall be physiologically inactive when improperly applied. For these reasons we have taken much interest in an article which appears in the *Journal of Laryngology, Rhinology, and Otology* for February, 1916, and which we abstract for the Progress columns of this issue, with the exception of the bibliographic list of articles upon which the author bases his conclusions. He well says that adrenalin being an exceedingly active preparation of fleeting influence upon blood-pressure can, possibly, be well supplanted at the present time by pituitrin, which acts with sufficient promptness in emergencies and, at the same time, exercises an influence which is more prolonged and therefore more useful. There can be no question but that both of these products have established for themselves a permanent, lasting, and wide-spread sphere of usefulness in an unusually large field of conditions.

Summarizations from time to time of our knowledge concerning these drugs, such as the one to which we call attention on this occasion, are of value in giving us clearer conceptions of the limitations of powerful and useful drugs.

PROPHYLAXIS OF TETANUS.

The comparatively large experience of tetanus afforded by the casualties of the present war has given an opportunity of confirming the high estimate of the value of serum injections in the prevention of tetanus, though as yet not with a completeness and accuracy which might seem desirable.

MacConkey (*British Medical Journal*, Dec. 11, 1915), quotes the "Memorandum on the Treatment of Wounds in War" to the following effect:

"The prophylactic use of tetanus antitoxin is a proceeding of well-established value.

"Since, in the first two months of the war, more cases of tetanus occurred than had been anticipated either by ourselves or our Allies, it was decided to direct that a preventive dose of serum should be given to every wounded man. The results have been excellent, and in the last six months there have been only 36 cases of the disease among those who received a preventive dose of serum within twenty-four hours of being wounded.

"The preventive dose of 500 U. S. A. units should be given subcutaneously at a distance from the wound at the earliest possible moment. In severe wounds medical officers not infrequently give 1500 units; there is no objection to this, but at the same time there is no evidence that the smaller dose is insufficient if given promptly."

The German reports are practically unanimous in corroboration of the views thus expressed. As to the incidence of tetanus Hinterstoisser states that in the Franco-Prussian war there were among 95,000 German wounded 350 cases of tetanus, or 0.36 per cent, whilst on the western front during two months of 1914 there occurred among 27,677 German wounded 174 cases of tetanus, making 0.62 per cent. In the Crimean war, of 12,094 wounded English 19 had tetanus (0.15 per cent). In the American Civil War, of 217,000 wounded there were 505, or 0.2 per cent. Of 51,700 Russians wounded in the Russo-Turkish war there were 66, or 0.12 per cent. Therefore the incidence of tetanus in the present war is greater than would have been anticipated from previous experiences.

As to the development of tetanus in those who have received prophylactic injections it is to be noted that this occurred in 0.26 per

cent. In many instances this is explained upon the ground that antitoxin injections were given so late that there was no time for them to counteract the effect of the toxin already absorbed. Certain anomalous cases are reported in which the failure of the prophylactic injection is not easily explained. Thus v. Behring records the case of his assistant who was infected in 1895 through the nasal mucous membrane when he was preparing dried tetanus toxin; again in 1898 by inhaling dried powered tetanus toxin—in this instance there was early tetanus of the diaphragm; again in 1902 by a litre flask of bouillon culture breaking in his right hand and pieces of glass penetrating deep into his palm. The same day a plentiful amount of antitoxin was injected into the right arm. The fourth day there were suspicions of tetanus, which rapidly progressed in spite of further injections of serum until the nerve trunks in the right axilla were exposed, and as much as possible of Behring's strongest serum was injected into each of them. Tetanus ceased to progress and the case slowly went on to recovery, but the use of the right arm was interfered with for a long time.

As to the duration of the immunity afforded by antitetanic serum, it is evident that the protective effect is distinctly ephemeral. Therefore Levin concludes that it is better to give a series of small doses rather than one large one, and holds that if the dose of 500 units is repeated at the end of a week or of a fortnight after the receipt of the wound we should not use any more serum, and we should probably get a more prolonged immunity than by giving at one dose the 1500 units which some surgeons seem to prefer.

Cases are reported of very late development of tetanus. Thus Don notes the case of a man wounded in the shoulder December 21, 1914, and given a prophylactic injection, who developed tetanus March 2, 1915. Tetanus bacilli were found in the pus. Gardner and Bawtree state that a wounded man may act as a carrier of tetanus bacilli for at least two months after the date of the wound, and without any reason on clinical grounds to suggest that these bacteria are present in the tissues. It is further suggested that the surgeon may be the cause of the development of tetanus by the use of procedures which under ordinary conditions would be quite harmless, but which are not safe owing to certain peculiarities of the tetanus bacillus. It has been experimentally shown that tetanus spores may remain in the tissues of a guinea-pig for about four weeks, and at that time may be activated by injections of quinine or of staphylococci. White mice will harbor tetanus spores in the subcutaneous tissues for at least four months, at the end of which time the spores may be activated by staphylococci but not by quinine, and at the site of inoculation there may be produced as much as 10,000 mouse minimal lethal doses of tetanus toxin.

Fleming examined bacteriologically 127 wounds within seven days of infliction, and found tetanus bacilli to be present in 22 of them.

Bond records cases in which after all incisions and sinuses round a compound fracture involving the elbow-joint or hip or other joint had completely healed, even simple passive movement of the joint under an anesthetic has lighted up a violent reaction, the reappearance of the old sepsis and the formation of local abscesses, although no incision was made, nor any solution of skin surface produced.

Berard and Lumiere speak of cases of tetanus following some operation or trauma affecting a wounded soldier who had a prophylactic dose of serum and had long recovered apparently from his wound. It is regarded as imperative when an operation is proposed in the wounded who may have been infected with the tetanus bacillus, to bear in mind that there may be toxin circulating in the body, and to give them a large prophylactic injection intravenously. Behring notes that the amount of antitoxin present in 1 Cc. of blood a few minutes after an intravenous injection of antitoxin remains constant for nearly sixty minutes.

REPORTS ON THERAPEUTIC PROGRESS.

THE SIMILARITY AND SYNERGY OF MORPHINE AND STRYCHNINE ACTION.

In the *Journal of Pharmacology and Experimental Therapeutics* for November, 1915, McQuigan and Ross report a research on this subject and say that from the work recorded the following conclusions may be drawn:

1. Morphine when injected intraspinally into mammals (dogs and cats) in adequate doses will produce tetanus after a latent period. Codeine which is apparently not oxidized in the body will not produce tetanus.

2. Morphine when oxidized to a certain degree and injected into the spinal canal of dogs and cats, or into the lymph sac of frogs, will produce tetanus more quickly than unchanged morphine. Artificially oxidized codeine will also produce tetanus when injected in this way.

3. Oxidized morphine when administered otherwise than directly into the cerebrospinal fluid will not produce convulsions in mammals (dogs).

4. The strychnine-like action of morphine is apparently due to an oxidation product which is first produced and then destroyed in the body. Differences in the rate of oxidation will explain the varied reaction in different animals.

ARTIFICIAL PNEUMOTHORAX IN TUBERCULOSIS.

Considering this topic in the *Boston Medical and Surgical Journal* of November 11, 1915, Otis states that there seems to be no doubt that the unilateral cases with but little or no infiltration in the other lung, and that inactive, and where there is still a fair amount of resistance, offer the most favorable conditions for this treatment and give the best results. The percentage of such cases which are either arrested or greatly improved is placed as high as forty or fifty (Floyd).

To assume that if the operation does no good it will do no harm is, the writer believes, false; for there is always the possibility of pleural shock, gas embolism, subcutaneous emphysema, infection of the pleural cavity, disturbance of the blood supply from displacement of the heart, and a lighting up of the inactive process in the other lung. It is an operation that should only be entered upon advisedly, discreetly, and in the fear of these possible dangers. One must also bear in mind that although he may consider the operation a very simple one, to the patient it means an operation, with all the dread that the word suggests, and he will not infrequently elect to take his chance without it when it is advised rather than undergo the mental anguish which the fear of an operation produces. This fact again reduces the number of cases to which can be applied the pneumothorax treatment.

A word with regard to the *x*-ray. The consensus of opinion is, the writer thinks, that one is not justified in carrying on the treatment without constant access to the *x*-ray with a skilled technician. Before beginning the inflation a careful study of the *x*-ray picture of the lungs should be made and subsequently, both before and after each inflation; only in this way, by ocular evidence, can we be sure that the case is a favorable one for the treatment, and determine its success. Moreover, we can thus avoid many of the dangers incident to it.

As to the apparatus employed, there are almost as many kinds, or modifications of one or another kind, as there are operators. The main requisite is to use an instrument with which one is familiar, and which is as simple as the conditions will allow. Whatever the apparatus used, it should have a good manometer which can be easily read, and an arrangement whereby the flow of gas can be readily regulated as to pressure, and be steady. One of the most satisfactory forms of apparatus which has come under the writer's observation is that of

Professor Deneke of St. George's Hospital, Hamburg. In brief, it is made double. Upon one side of an upright standard is a complete arrangement for the injection of nitrogen gas, and on the other side is a replica of the same for the injection of oxygen gas, Professor Deneke's idea being that greater safety is insured if on the first injection oxygen is used, so that if by any chance the needle may have entered a vessel, the oxygen gas on account of its rapid absorbability will be much less likely to produce gas embolism. By simply turning a stop-cock, nitrogen gas can be substituted for the oxygen gas.

There have also been as many kinds of needles as apparatus, each operator having his favorite one. Deneke's needle seems to the writer to have certain advantages, its peculiar characteristics being its extreme simplicity, consisting of a cannula and stylet, the cannula having a less acute angle at its perforated end than the ordinary needle, and is closed at this extremity, the opening being in the side just above the point.

There are many other problems in connection with artificial pneumothorax which could with great interest be discussed, such, for example, as the amount of positive pressure permissible in case of adherent pleura, the amount of gas introduced at any one time and the frequency of introduction, the length of the time the treatment should be continued, the effect upon the neighboring organs, the contraindications, and the employment of the treatment in recurring pleuritic effusions, bronchiectasis, and abscess.

The scope of artificial pneumothorax is apparently not yet fully determined, but that it has won a permanent place in the treatment of tuberculosis is assured. In the very conservative words of Saugman, "it has fully justified its place in the treatment of some severe cases of pulmonary tuberculosis, and by it recovery sometimes may be obtained when any other treatment would have failed." It is well to bear in mind, however, that it does not by any means take the place of the well-known measures for increasing and maintaining the resistance, such as fresh air, rest, and good and sufficient food, but, like tuberculin, it is an additional aid in certain cases and may save the day.

BLOOD TATTOOING OF THE SKIN FROM HYPODERMIC INJECTIONS OF MORPHINE.

In the *Proceedings of the Royal Society of Medicine* for July, 1915, PARKES WEBER records the case of a woman, aged sixty-seven, a morphinist, who from the age of twenty-seven to the age of fifty-nine had been accustomed to take morphine, almost entirely by the mouth, up to 8½ gr. per diem. She then entirely discontinued taking the drug until after an operation for gall-stones, about four years ago, when she got into the habit of giving herself hypodermic injections of morphine and atropine. Since then she had usually, in the course of every day (twenty-four hours), injected from 1 2/3 gr. to 3 1/3 gr. of morphine sulphate, together with from 1/24 gr. to 1/10 gr. of atropine sulphate, under the skin of her upper extremities or the upper part of the front of her chest. At the present time the skin of these regions had a stippled appearance from innumerable minute bluish spots, each bluish spot marking the site of a former hypodermic injection.

These bluish spots constituted a kind of tattooing; probably some iron substance derived from the needle of the hypodermic syringe had on each occasion remained under the skin. Similar bluish spots in the skin of a morphinist (a man) under the care of Dr. Francis Hare were due, as Dr. Hare kindly informed Dr. Weber, to minute carbon particles introduced under the skin with the hypodermic syringe, as the patient had been in the habit of disinfecting the needle of the syringe in the flame of a wax match or of a wooden match. In fact, in that case the bluish spots were due to a genuine blue-black tattooing, since for that purpose the finest quality of Indian ink or Chinese ink (which consisted of very minute particles of soot or carbon) was, Dr. Weber be-

lieved, usually employed. Dr. Hare's patient had been distressed in regard to the presence of the bluish spots, for he regarded them as very "tell-tale," and likely to prevent him from obtaining a desired appointment. In Dr. Weber's case, though the bluish spots exactly resembled those produced by tattooing with carbon particles of Indian ink, it seemed far more probable that they were produced by minute iron particles from the hypodermic needle, since the patient had always cleaned the needles, she said, by washing them out with hot water, and had never disinfected them in any flame. Similarly, workers in some trades developed blue marks in the skin from the entry of particles of iron.

In addition to the bluish spots the patient had a few little hard fibrous nodules in the subcutaneous tissue, resulting also doubtless from hypodermic injections.

THE RESULTS OF THE EXAMINATION OF CULTURES FROM SUSPECTED CASES OF DIPHTHERIA AND OTHER PHARYNGEAL AND NASAL CONDITIONS.

MOFFIT in the *Pennsylvania Medical Journal* for October, 1915, reaches these conclusions from an investigation he has carried on:

1. Diphtheria cannot be diagnosed in its early stages without the assistance of the laboratory.

2. In case of negative reports on examinations for diagnosis, subsequent cultures should be taken in suspicious cases, to eliminate the possibility of mistakes.

3. The throats of patients having had diphtheria are not free from the bacteria at any given time after the onset of the infection.

4. Negative cultures should be found before quarantine for diphtheria is removed.

5. When diphtheria bacilli persist in the throat after all other manifestations of the disease have disappeared, they may often be readily eliminated by the use of buttermilk as a gargle.

6. Virulent diphtheria bacilli may be present in a nose or throat without causing any symptoms in the nose, though capable of causing the disease in contacts.

7. Membranous laryngitis or croup may be caused by the pneumococcus, and such an infection may prove fatal.

EXOPHTHALMIC GOITRE.

CAMPBELL in the *Clinical Journal* of October 13, 1915, says that treatment is not satisfactory. This is evident from the multitude of the remedies which have been from time to time advocated for the cure of exophthalmic goitre. One reason for the failure that is so frequently met with from some line of treatment, whilst success may follow a directly opposite method, is due to the assemblage under one name of cases which differ essentially in their pathology. For instance, if all the cases which show some enlargements of the thyroid, occasional palpitation, and perhaps slight exophthalmos are to be classed as cases of Graves's disease, then he thinks we are bound to flounder hopelessly in treatment, for the large majority of cases showing these symptoms in a mild degree are merely due to blood-pressure changes, associated with anemia, as the result of or in conjunction with the onset of menstruation. Again, all cases of hard goitre in which there is insufficiency in thyroid secretion, associated with an interstitial cirrhosis, must be excluded, even though they show some slight exophthalmos, for in them the rational treatment is either the administration of thyroid juice or of iodine in some form, the latter being a powerful excitant to the secreting cells of the gland.

These cases account, the writer thinks, for the successful results attributed to potassium iodide or thyroid feeding in certain cases which have some of the attributes of Graves's disease. It is, of course, in the late stages of Graves's disease, when hypertrophy is being succeeded by atrophy and over-activity by under-activity, that this line of treatment is the right one. These latter

are no longer, however, cases of Graves's disease, but of early myxedema. Limiting oneself, then, to cases of true Graves's disease, the writer might first mention various forms of treatment which have been used, but which have given rise to very contradictory reports as to their permanent efficacy. *X*-ray treatment has been credited with having cured a large number of cases, and the immediate results are often very striking, but as to permanent cure the reports are conflicting. This may be accounted for by the fact that failure certainly followed this method of treatment in many of the early cases, but recent reports with improved technique have been very encouraging. It must, however, be borne in mind that occasionally disastrous skin changes may occur many months after the treatment has been discontinued.

The serum treatment is based upon the view that normally the thyroid secretion acts as an antidote to certain autotoxins developed elsewhere in the body, and, conversely, that these autotoxins serve to neutralize the thyroid secretion. If this hypothesis, and it is only a hypothesis, be true, then when the thyroid secretion is present in excess it is only necessary to inject autotoxins obtained from thyroidectomized animals to neutralize this excess and so to again establish equilibrium. The method has been strongly advocated either in the form of an alcoholic ether precipitate of the milk of thyroidectomized goats (Rodagen), or antithyroid serum. The writer has not personally used these preparations to any large extent because the results of the cases in which he has employed them have not been encouraging.

Many surgeons strongly advocate complete or partial removal of the gland, stating that even in cases of complete removal there is always sufficient thyroid or parathyroid substance left to prevent the occurrence of myxedema, and that even if this latter condition should supervene it is much less serious and more manageable than Graves's disease. Tying the thyroid arteries is a theoretically better procedure, but it has not many advocates. Kocher records out of 59 cases of partial or complete thyroidectomy 76 per cent of cures, improvement in 14 per cent, slight improvement in 3.3 per cent, and death in 6.7 per cent. Most other operators have had a higher mortality, though Dreyfus collected the statistics of 127 cases in which the results were almost identical with those of Kocher. Further experience has hardly borne out these favorable results, and Halsted has recently advocated thymectomy in addition to thyroidectomy as being more beneficial than the latter operation alone.

Personally the writer has had good results with rest, fresh air, a diet rich in fats and poor in nitrogenous constituents, application of cold locally, the administration of bromide in full doses as occasion required, and the regular use of calcium. Meat juice should be prohibited and milk should be taken sparingly, as both of these act as excitants to the thyroid gland. Belladonna applied locally has seemed to be of use in some cases, but internally the writer thinks it is not to be recommended, as it certainly sometimes aggravates the mental excitability. Digitalis is of value when the heart condition indicates the need for its use, but, like many other drugs that have been recommended, it is required not for the disease but for its effects. Local electrical treatment has been advocated, but whilst the good derived from it is doubtful, it certainly in some cases does harm. It is useless, whatever the treatment adopted, to expect rapid results, and in many, in spite of all treatment, the psychic symptoms develop, the emaciation increases, and the end comes either from some intercurrent malady, such as pneumonia, or with startling suddenness from heart collapse. In cases of pregnancy, in which the mental loss of equilibrium is often associated with and probably to a large extent caused by the hyperactivity of the thyroid, improvement of the thyroid condition is accompanied by a corresponding improvement in the mental affection. In forecasting the future in a case of Graves's disease it is important to bear in mind that in many cases the disease occurs in those of a mark-

edly neurotic or degenerate type, and that, altogether apart from the thyroid disease, the case may be mentally going downhill. Bearing this in mind the writer thinks that, given opportunity for efficient treatment, the prognosis, though always uncertain, is by no means as bad as is often stated, and that recovery, complete and lasting, occurs in a considerable proportion of cases.

IODIDE OF SILVER IN OCULAR THERAPEUTICS.

MOLONEY says in *the Clinical Journal* of October 12, 1915, that as a general practitioner it has often appeared odd to him that there should be so few drugs which can be locally applied to the eyes for, say, the cure of corneal opacities and conjunctivitis, both in its angular and other forms, and for the treatment of gonococcal ophthalmia. Protargol, it is true, is a useful but expensive agent. The ideal therapeutic agent in ocular troubles must be highly antiseptic, astringent, non-irritating, alterative, and rapid in action. Iodide of silver, which is inexpensive and easily made, possesses all these qualities, and has given the writer highly satisfactory results.

The old method of rubbing in the oxide of mercury in the hope of removing opacities in the cornea is certainly slow and wearisome, and requires much labor and patience; besides it is highly irritating. The cornea has no lymphatics, and the oxide of mercury is not a soluble salt, and consequently the amount absorbed must be small.

From the consideration of pathological, histological, and anatomical facts as regards the cornea, it will be obvious that the efficacy of the ointment of yellow oxide of mercury is mostly due to its mechanical action. Hence the value and usefulness of the iodide of silver will be understood.

Being troubled with a corneal nebula Moloney perseveringly used oxide of mercury ointment for some weeks, producing irritation of the lids and little benefit. He cast about for an efficacious remedy. Iodide of potassium would, of course, have been the drug were it not too irritating to a mucous membrane. It occurred to him to use a salt which combined the activity of iodine with the astringent and antiseptic qualities of silver. He tried iodide of silver, and to his intense surprise vision began to improve after the first twenty-four hours. Eventually he showed the eye to a specialist, and he said that the nebula had got very thin.

In the use of this salt, as in the case of most ocular astringents, there are certain contraindications which must be observed to prevent disastrous results. In distinction from some German salts there is no danger of argyriasis, nor does it stain the skin as the nitrate of silver does.

The writer always begins with a solution of 5 grains to the ounce. In gonorrheal ophthalmia it is most efficacious. One drop of a weak solution instilled three times a day or oftener in cases of extensive chemosis and danger of corneal sloughing alters the condition in a few days. Again, in cases of chronic palpebral conjunctivitis, in which a weak perchloride of mercury solution is indicated, the iodide of silver acts quickly. Moloney had also satisfactory results in the treatment of pannus with this salt; in ulcer of the cornea it should be cautiously used, as his experience on this point is not sufficient for him to make a positive statement. All he can say is that it promises to be of use.

As bacteria play an important part in diseases of the conjunctiva and a bacteriological examination is made before cataract extraction, the utility of an instillation of salt will be obvious, especially as its action on the gonococcus is so potent.

ENDAMEBIC DYSENTERY.

In the *New York Medical Journal* of October 23, 1915, BARLOW claims that about eighty per cent or more of cases of infection with Endamœba histolytica remain free from relapse for seven months or more, if treated for at least ten days continuously with not less than one grain daily of emetine.

If treated for less than nine days, relapse is almost inevitable.

The simultaneous administration of ipecac does not diminish the number of patients who show relapse; but the subsequent administration does diminish the number.

A permanent cure is possible in a shorter time with emetine than with ipecac.

It is preferable to inject the daily dose at one time, or at least in doses of not less than one grain.

Cases of hepatitis and liver abscess usually remain free from either intestinal or hepatic relapse, partly on account of the more thorough treatment which they receive.

The bowels should not be flushed with frequency. If there is marked diarrhea, opiates should be given in sufficient quantity to control it. The patient is relieved of suffering, and the retention of the emetine hastens the cure and decreases the likelihood of relapse.

If the patient can do so, he should report monthly for at least six months to some one competent to recognize either cysts or vegetative forms. Examination should be made after a saline, and immediately after the stool is passed. If either is found, another course of emetine, of at least one grain daily for nine days, should be given. The alternative is the continuous or intermittent use of ipecac for at least six months, or successive courses of emetine of at least nine days.

Infections with Craigia are difficult to cure. They are best treated with ipecac and emetine in combination; but the treatment must be continued for at least one month, and even then a large proportion of relapses must be expected.

As dysentery is very prevalent around New Orleans, the plans of treatment which men prominent in the profession have adopted as a result of large experience are of value.

Weis gives emetine one-half to one grain daily for five days, then sixteen salol-coated five-grain pills of ipecac, diminishing one pill each day for ten days; then repeats the treatment and on discharge gives the patient 60 to 100 pills, to be taken two each night.

Bel uses both emetine and ipecac, according to the requirements of the case, until a clinical cure is accomplished, and lays great stress upon an intermittent treatment by ipecac for from six to twelve months following.

Elliott gives from one-half to one grain daily, from fifteen to thirty days, accompanied by ipecac in decreasing doses, to be followed by an intermittent treatment by ipecac for several months.

It is to be understood that the foregoing outlines are only general plans, to be altered and supplemented to meet the requirements of individual cases.

The plan which the author considers best, according to our present knowledge, can be carried out only with intelligent patients who are within reach of a competent laboratory worker. One grain (or more, for one or two days) is given daily for fifteen days, followed by sixty to eighty grains of ipecac for from five to twenty days, according to whether intestinal irritation is produced or not. The bowels are cleansed by a saline at the beginning of treatment, and about every five days. If there is either diarrhea or colic, it is checked by opiates, usually paregoric, in small repeated doses, until comfort is obtained. If severe diarrhea is present, liquid diet and rest in bed are required until the symptoms improve, when a more nourishing diet and gentle exercise are allowed. On discharge the patient is instructed to return once each month for examination of a fresh stool obtained after a saline cathartic. If either endamebas (of any variety) or cysts of Endamœba histolytica are found, the treatment is repeated.

Of eighteen patients treated in this way, who left within seven months after treatment, all but four were both clinically and microscopically well from three to six months after treatment.

This plan has three advantages: First, even intelligent patients are not likely to keep up a prophylactic treatment, while if amebas are actually found they will readily take a second treatment. Second, when they are clinically well, and with merely a latent infection, the second course of treatment will usually result in a complete cure, while

with an empirical after-treatment with ipecac from six to twelve months must elapse, and even then several examinations are necessary to be certain of cure. Third, the repeated examination of cases results in the accumulation of data which make it possible to determine the dose and duration of treatment necessary for permanent cure, and is, therefore, of the highest scientific and practical value.

As this report does not pretend to be a discussion of the use of emetine, but only a small contribution to the knowledge which must be accumulated before the question of proper doses can be decided, no review of the literature is attempted, and only such references are given as have a bearing upon the point at issue.

ACUTE OTITIS MEDIA IN INFANCY.

In the *Boston Medical and Surgical Journal* of October 21, 1915, EMERSON says that in all primary infections of the respiratory tract, and especially in affections of the respiratory tract secondary to contagious diseases, care should be exercised to keep the nasopharynx free from mucus and crusts that may cause occlusion of the Eustachian tube. Two or three drops of liquid albolene or of a 10-per-cent solution of argyrol may be introduced into each nostril three times a day. During the stage of acute nasal congestion steam inhalations are helpful. An even temperature should be maintained in the room. The child should be protected from strong winds and dust. The air in overheated houses and flats becomes exceedingly dry and consequently irritating. Receptacles for water attached to the side or placed on top of radiators will evaporate one to two gallons daily, appreciably increasing the humidity. In older children the following ointment is employed:

Menthol, grs. vij;
Eucalyptol, grs. vij;
Lanolin, drachms vj;
Vaselin, drachms ij.

Applied inside the nostrils this protects the congested turbinates and so keeps the nares clear. Also in older children, in cases of excessive discharge from the throat, irrigations of hot normal salt solution two or three times a day free the nasopharynx from muco-pus. The irrigation may be done by the physician with a metal syringe or by the nurse with a fountain syringe, inserting the glass part of a curved eye-dropper into the end of the rubber tube and so directing the stream into the throat and allowing it to flow out into a pus basin, with the patient lying in bed. A spray of menthol, 5 grains, and benzoinol, 1 ounce, should be used with an atomizer to protect the inflamed mucous membrane from irritation. Swabbing the throat with iodine, 20 minims to the ounce of glycerin, is also useful.

If, notwithstanding these precautions, the Eustachian tube becomes occluded and the drum membrane begins to show congestion along the handle of the malleus, the following treatment should be given to open the tube: a mixture of four drops of adrenalin solution 1 to 5000, and cocaine one-half to 1 per cent, should be allowed to flow through the nostril on the affected side, back into the throat, the patient's head being tipped backward in such position as to cause the solution to flow toward the orifice of the tube. This should be followed in five minutes with a few drops of a 20-per-cent argyrol solution, which by its higher specific gravity keeps the tube open. This should be repeated in three hours if there is pain. Frequently the symptoms, congestion and temperature, will disappear with this treatment. If, however, the inflammatory process continues to progress and the symptoms increase, the drum should be incised without waiting for bulging or pus. The operation should be performed by the aurist, if available, otherwise by the attending physician, because the majority of these cases have a mixed infection, and a delay of even a few hours may result in rupture of the drum and burrowing of pus into adjacent structures. The attending physician can safely make a curved incision of the drum, extending from the posterior lower quadrant up to the attic, under direct vision. A rapid fall in temperature and alleviation of symptoms should follow. Re-

peated incisions should be made, if necessary, for free drainage, but it should be remembered that obstruction of the Eustachian tube in the throat may prolong a discharge from the ear. In infants etherization is not necessary, but in older children enough ether should be given to allow time for a careful and accurate incision. The other ear should be watched with special care as a double otitis is frequent.

In every case of contagious disease and of affections of the respiratory tract in children, measures should be inaugurated at once to keep the nasopharynx clear and so maintain drainage through the Eustachian tube. In such cases the ear drum should be inspected at every visit of the physician.

An electric ear instrument gives a clear picture of the drum with a minimum disturbance of the child.

In cases of otitis media when the symptoms and the local condition do not improve under treatment, the drum should be incised by the aurist, if available, otherwise by the attending physician, without waiting for bulging or pus.

Every child after an attack of acute otitis media should have his epipharynx examined and treated by a specialist trained to recognize the close relation of the nasopharynx to the ear.

THE SPINAL FLUID IN SYPHILIS AND ITS RELATION TO TREATMENT.

In the *New York State Journal of Medicine* for October, 1915, MILLER admits that many phases of the relations of the cerebrospinal fluid to the diagnosis, prognosis, and therapy of syphilitic disease of the central nervous system have been inadequately treated or omitted entirely in his paper. He thinks, however, that enough evidence has been brought forward to warrant the following conclusions:

1. The central nervous system is not infrequently invaded by the Treponema pallidum in the earliest stages of its generalization in the human host. This fact is conclusively proved by the frequency with which abnormal changes may be demonstrated in the spinal fluids of individuals in the acute secondary period. Of the total number showing such changes, only a small percentage subsequently develop luetic disease of the nervous system. The precise factors which determine this incidence are not yet known.

2. Certain fairly characteristic and regular reactions in the cerebrospinal fluid are of pronounced value in the diagnosis of syphilis of the brain and spinal cord. No one is pathognomonic of any condition. Conclusions, therefore, to be of any value, must be based upon the analysis of all available clinical and laboratory data.

3. There can be little doubt as to the wisdom of making periodic spinal fluid examinations in all cases treated or not, known to have had a luetic infection. The information to be gained will doubtless prove of great value, first, in the prevention of tabes, of cerebrospinal lues, and of paresis; secondly, in broadening our knowledge of the exact processes underlying these diseases; thirdly, in determining the conditions, biological and physical, which favor their occurrence; and fourthly, in controlling the efficiency of our therapeutic measures.

4. There is urgent need for standardizing the methods of spinal fluid examination and the Wassermann reaction. The varying and discordant results of good observers is in part due to the employment of different methods and the expression of presumably identical results by all sorts of different terms or symbols. It is felt that the adoption of a uniform technique would greatly advance our knowledge, make possible the comparison of a greater number of cases, and serve as a more reliable check upon the benefits of various forms of treatment.

5. The chief point to be emphasized is the urgent need of diagnosing syphilis of the nervous system before the causative organism has been able to build up its defensive mechanisms and to initiate irreparable degenerative processes in the tissues of the host. This can probably be done, in part at least, provided intelligent use be made of lumbar puncture.

THE TRUE POSITION OF ADRENALIN.

The *Journal of Laryngology, Rhinology, and Otology* for February, 1916, contains an editorial in which the following statements are made:

That adrenalin is regarded as a dangerous drug by many pharmacologists and anesthetists comes with a shock of surprise to otolaryngologists, accustomed as they are to use it, locally, at all events, in a very lavish manner. For the general opinion among throat and ear surgeons undoubtedly is that adrenalin is a safe as well as a powerful remedy, particularly in cocaine poisoning and in condition of surgical shock, therein agreeing with Brünings, who says:

"In the course of one or more minutes ½ to 1 Cc. of the usual 1:1000 solution" (of adrenalin) "(or, better still, the corresponding quantity of a ten times diluted solution) is injected into a vein. Thereupon the mucous membranes lose their color almost at once; an enormous rise in blood-pressure takes place, and the heart, under the influence of the direct action of the adrenalin, often begins again to beat, when all other stimulants had failed" ("Die direkte Laryngoskopie," p. 173, f. n.).

When, however, we listen to recent workers upon the pharmacology of adrenalin, we discover that a proceeding such as this of Brünings would be regarded by them with serious misgivings.

Injected directly into a vein, as Brünings directs, adrenalin induces a wide-spread series of phenomena which Elliott has shown to be due to stimulation of the sympathetic nerves all over the body. To begin with, there is a general contraction of arterioles, save in the lungs, the brain, and the heart, in consequence of which a great rise in blood-pressure occurs. Obviously, if the heart be weak, the obstruction to its efforts produced by the general vasoconstriction may have serious consequences, unless, as Brünings says, the action of the adrenalin upon the heart muscle is of a stimulating character. As to this, if we are to credit recent observations, Brünings and the rest of us are wrong. Watson points out that the rise in blood-pressure affects the systolic phase only, the diastolic pressure being actually much lower than normal. These are the characters of the blood-pressure readings in aortic regurgitation. Consequently Watson suggests that adrenalin prevents the normal closure of the aortic valves by its dilating action upon the muscular tissue of the root of the aorta. If this be true, then the rise in blood-pressure after the injection of adrenalin is misleading as an indication of an increase in the vigor of the circulation.

In opposition to this opinion, however, we note the statement of a well-known pharmacologist, such as Cushny, that the effect of the drug upon the sympathetic nerves of the heart leads to an acceleration and augmentation of the beat, which, after a longer or shorter period of reflex vagus inhibition, recurs and persists until the action of the drug has passed off.

Thus opinion does not seem to be quite decided on the point.

Again, adrenalin given hypodermically in the course of chloroform narcosis has on several occasions been followed by the collapse and death of the patient, an action which Levy has attributed to cardiac fibrillation.

For this reason Mortimer and others have uttered warnings against the use of adrenalin, not only intravenously, but even hypodermically, during chloroform narcosis and in shock.

Watson, indeed, goes so far as to say that "adrenalin is a dangerous drug which should always be used with caution and never as a general blood-pressure elevator," which is exactly opposite to Brünings' advice given above.

Which is correct?

Most practicing otolaryngologists, arguing from their own experience of adrenalin in all sorts of conditions, will probably be inclined to side with Brünings, and to look upon adrenalin as being not only harmless, but also useful in counteracting and relieving surgical shock. To begin with, there is no doubt whatever that, when cocaine is used for surface anesthesia in combination

with adrenalin, cocaine poisoning is less frequent than when the former is used alone. Again, when adrenalin is combined with novocaine and eucaine and used in infiltration anesthesia, shock both during and after operation is certainly much less severe than when a general anesthetic is employed.

It is true that when adrenalin is used in these ways the local ischemia, which is at once induced, sets up a barrier to the rapid absorption of the drugs into the general circulation. Nevertheless, it is against the hypodermic use of adrenalin, no less than against its intravenous administration, that Watson and the anesthetists have uttered their warning.

Then, again, there is the use of adrenalin hypodermically in the treatment of asthma, a method which its success is rendering exceedingly popular. The apparent mystery of the action of adrenalin in asthma, by the way, is cleared up by Cushny, although, curiously enough, he does not seem to mention its employment in this complaint.

"Adrenalin," he says, "injected intravenously dilates the bronchi widely, an effect which is especially noticeable when they have been previously contracted by pilocarpine and physostigmine. This is not the same as the dilatation caused by atropine, but arises from adrenalin stimulating the terminations of the bronchial sympathetic fibers, which causes relaxation of the muscle." ("Text-book of Pharmacology and Therapeutics," sixth edition, 1915, p. 368.)

The present writer has a vivid recollection of a case in which, after a nasal operation had been performed upon an asthmatic patient under chloroform, an alarming attack of asthma set in as he was coming round from the anesthetic—the usual time for such an event, we may remark. The breathing became more and more labored in spite of all efforts to relieve it, and cyanosis was being followed by the ominous livid pallor that signals the imminent failure of heart and respiration when 5 minims of adrenalin solution (1:1000) were injected hypodermically. The effect was magical. In about half a minute the spasm ceased, and the breathing became quiet and peaceful, with a rapid restoration to the normal in the color of the lips and face.

It is said that the habitual use of adrenalin in asthma is likely to lead to arteriosclerosis. At all events, a German experimenter has reported this as having occurred in animals. Whether his observation has ever been confirmed or not it is difficult to say. The belief in such an ending, nevertheless, has obtained a wide currency. All the same, most asthmatic people seem inclined to risk the arteriosclerosis.

Equally in opposition to those who look upon adrenalin as a dangerous agent is the practice, suggested and carried out by Milian (see *Journal of Laryngology, Rhinology, and Otology,* vol. xxix, p. 168), of counteracting the depressant effects of salvarsan upon the circulation by an intramuscular injection of 1 to 2 Cc. of a 1:1000 solution of adrenalin, immediately before the arsenical compound is administered.

From the foregoing remarks, then, it will be seen that in this matter of the action of adrenalin upon the system there seems to be considerable disagreement between the clinician and pharmacologist, a by no means unprecedented occurrence, and one which is, probably, to some extent traceable to the fact that the clinician is an observer of the action of the drug in abnormal conditions, while the pharmacologist records its behavior in normal conditions. Watson's experiments, for example, were carried out in healthy young men and women, in whom, of course, the blood-pressure behaves quite differently from what it does in asthenic persons.

In chloroform narcosis, again, the occurrence of a few fatalities after adrenalin had been injected may only have been a coincidence. Levy's explanation, that death was due to the adrenalin setting up fibrillation of the cardiac muscle, is vitiated by the fact that chloroform itself is said to induce fibrillation at times, and to cause death by doing so. And when it is remembered how frequently adrenalin is employed during surgical operations under chloroform without any apparent ill effects, one feels even less inclined to adopt the opinion that it is

particularly dangerous to employ adrenalin under these conditions.

A survey of the whole question, then, in all its bearings, leads us to the conclusion that the case against adrenalin is, for the present, not proven. Further investigation on the part of the pharmacologist is needed before the reliance of the operating surgeon upon the safety of adrenalin can be broken. At the same time, the latter cannot avoid being influenced by the warnings which have been given, to the extent of keeping a weather-eye open to the possibility of trouble arising from this source. The natural tendency, no doubt, will be to limit the application of adrenalin to mucous surfaces and to subcutaneous tissues, and to avoid the intravenous administration of the drug. The last-mentioned method is, of course, only adopted in combating shock, and we possess in pituitrin, for example, an agent which seems to be almost, if not quite, as powerful a remedy for this disturbance as adrenalin is, without, as far as we know, any of the reputed dangers of the latter substance.

THE CHOICE AND TECHNIQUE OF THE ANESTHETIC.

In the *Journal of the American Medical Association* of October 23, 1913, BEVAN sums up our knowledge concerning the choice of methods for inducing surgical anesthesia. Chloroform because of its efficiency, comfort, and simplicity has probably been employed more generally the world over than all other anesthetics combined. And yet the time has come when chloroform in spite of its many advantages should be absolutely and finally discarded because of the huge mortality attending its use both on the operating table and the late chloroform deaths, and because there are for all classes of surgical cases efficient and much safer agents. It is possible that in military surgery chloroform may still find a legitimate place.

Ether by the open drop method is the safest general anesthetic known for producing prolonged anesthesia. It should be today the standard anesthetic in the surgical clinic. The discomfort of ether anesthesia when properly given by the open drop method by an expert can usually be practically eliminated. In the few cases in which the repugnance to ether is great, the sequence of gas-ether can be employed.

The closed method of giving ether is not satisfactory or so safe as the open drop method. Complicated apparatus to control the percentage of ether and to warm ether possesses no advantages over the simple drop method, and should be discarded. The giving of ether by the drop method is an art which must be acquired under the instruction of an expert.

Gas should be one of the general anesthetics employed in the surgical clinic. Its place should be for short anesthesias in which unconsciousness is desired and local anesthesia is not applicable—in reducing fractures and dislocations, opening abscesses, and in some more prolonged operations in which for special reasons gas becomes safer than ether, such as operations on the urinary organ with kidney insufficiency. A surgical clinic which does not frequently employ gas anesthesia is, from the standpoint of anesthetics, a poorly conducted clinic.

As a general anesthetic, scopolamine and morphine are to be absolutely and finally rejected both from general and obstetric practice. After it was generally agreed that scopolamine and morphine were too dangerous for use as an anesthetic, an extended trial of routine small doses of scopolamine and morphine preceding the general anesthetic was made, especially in Germany. The sequence has been responsible for many deaths. The evidence from the literature shows beyond question that even in small doses ¼ grain of morphine and 1/150 grain of scopolamine before chloroform, ether, or gas adds distinctly to the risks of the patient. It complicates the giving of the general anesthetic. It masks danger-signals. It adds to the percentage of vomiting and inability to void urine. It carries with it no advantage and many disadvantages, and should be rejected. It is not a good thing; it is not a kindness to a pa-

tient to bring him to the anesthetizing room dopey and flighty. For some time after the writer had finally rejected scopolamine and morphine before a general anesthetic, he continued to employ it before using local anesthesia. He has now discontinued it, and finds his results much more satisfactory and the local anesthesia quite as complete. In using local anesthesia, one must have the coöperation of the patient, and this one can have better with the patient in normal condition than when he is dopey. He has been pleased to find also that the occasional vomiting which occurred after his local anesthesias has practically ceased since discontinuing scopolamine and morphine, and that in his hernia operations the inability to void urine and the necessity to use a catheter do not occur. Preceding either the general or the local anesthesia, morphine and scopolamine should be rejected.

It is, of course, frequently necessary to use morphine on account of pain in surgical cases which later require operation under anesthetics, and where the indications are clear morphine should not be withheld because the patient is to be given an anesthetic. The anesthetist should be informed of the fact that the patient has had morphine.

That anesthesia can be produced by injecting cocaine and its substitutes into the cerebrospinal fluid of the cord is an interesting fact. The method, however, has no place in surgical practice. It is too dangerous to warrant its employment, and for every surgical condition requiring an anesthetic, there are safer and more efficient methods at our disposal.

Blocking has but a limited field. Blocking of the Gasserian ganglion, brachial plexus, etc., should be rejected. These are in themselves important surgical procedures, and cannot compete at all with the simpler and safer methods which are at our disposal. In dental surgery the blocking of the inferior dental and branches of the superior dental nerves has a very useful field. As a rule, nerve blocking should be limited to the blocking of nerves which appear in a dissection made under local infiltration anesthesia, as blocking the ileoinguinal nerve in a hernia operation under local anesthesia.

The writer believes that in local anesthesia with novocaine and adrenalin we have a very safe and satisfactory method which should be employed in a large group of cases. Wilms is using it in a majority of his operations in the Heidelberg clinic. The writer is not prepared to go that far. He does not believe that the range of local anesthesia should be stretched too far. He is using it in about 30 per cent of his cases.

Intravenous anesthesia with ether is too dangerous, too complicated, has no special advantages, and should be rejected.

Rectal anesthesia should be rejected.

Intratracheal anesthesia is dangerous. It is complicated and it possesses advantages in very few cases. When it was introduced it was welcomed as a simple method which had been experimented with in thoracic surgery. As a matter of fact, both the complicated differential pressure and the intratracheal methods have practically been largely eliminated as a result of further investigations in thoracic surgery, which have demonstrated the fact that most of the operable cases in thoracic surgery can be done either under local anesthesia or drop ether or gas and oxygen; that the necessity of preventing collapse of the lung when but one pleural cavity is opened was theoretical and not real; and lastly, by the fact that the extensive work in which both pleural cavities are involved, and such extensive work as attacking the thoracic part of the esophagus, cannot as yet be accepted as warrantable surgical procedures; furthermore, the introduction of the simpler method of intrapharyngeal anesthesia has eliminated the intratracheal method from the field of head surgery, in which for a time it seemed to have a place. On the whole, therefore, intratracheal anesthesia has little place in practical surgery.

It has been shown that with percentage-measuring machines there is danger of continuing too long the high percentage vapor —that is, the anesthetist watches the dial of his machine and not the patient. A jar which will allow air to pass over the ether,

through the ether, carried over the ether without coming into contact with it at all, or any combination of the foregoing routes, is easily constructed, cheap, and satisfactory. The rate of administration of the anesthetic may be governed by the same guides as in the drop method.

There appears to be no reason for the adoption of any of the expensive and more or less complicated ether-warming or percentage-measuring machines which are offered for sale.

After analyzing Crile's work and the work of competent physiologists, the writer has been forced to the conclusion that there is no scientific basis for Crile's statement that he can wholly prevent shock by sequestering the brain from the field of operation by blocking the nerves with novocaine. Crile's excellent surgical work is done not because of anociassociation, but in spite of it. The complicated sequence of scopolamine and morphine, gas, oxygen, ether, novocaine, and quinine and urea hydrochloride is a method open to many objections. The scopolamine and morphine, as the writer has attempted to show in this analysis, add distinctly to the risks of the patient and should be omitted. The gas-oxygen plus ether, if used alone, is an acceptable anesthetic sequence, but not so safe as a routine as drop ether and gas and oxygen used alone in properly selected cases. Novocaine used alone in the infiltration anesthesia is of great value and has a wide field of usefulness. Used in this sequence it has little value, certainly none in preventing shock. Quinine and urea hydrochloride has no value in this sequence, and used alone as an anesthetic cannot compete with novocaine and adrenalin. The writer believes, therefore, that we must reject both the theory and the practice of anociassociation.

The final results of the writer's analysis of the anesthetic problem are as follows:

1. Drop ether should be to-day chosen as the standard general anesthetic when a prolonged anesthetic is desired with relaxation and unconsciousness.

2. Intrapharyngeal ether should be chosen in mouth and jaw cases when it is desirable to remove the anesthetist and the anesthetic apparatus out of the operative field.

3. Gas should be chosen in short anesthesias in which unconsciousness is desired, and in special cases, such as kidney insufficiency.

4. Local infiltration anesthesia should be chosen when the surgeon has the full cooperation of the patient and when the field of operation can be completely infiltrated and anesthetized by a safe amount of novocaine and adrenalin.

These four simple and safe methods can be made to cover all surgical cases. This places anesthesia on a very unpretentious, simple basis, but here, as in most fields of surgery, we finally learn that simplicity is near the truth.

THE MANAGEMENT OF PLACENTA PREVIA.

In the *Long Island Medical Journal* for October, 1915, BEACH recalls that abdominal Cæsarian section for placenta previa was first recommended by Lawson Tait, and to-day there are operators who use it in all of their viable cases, and others who cannot see any indication for it in any case. Its routine adoption in all cases is certainly wrong, and even though it may give better statistics for both mother and baby, its use is not warranted unless we sterilize the patient or do the Porro operation. The risk of rupture of the Cæsarian scar at a subsequent pregnancy is a thing not to be overlooked. This is a real danger, one that cannot be easily foreseen, and, after all, the Cæsarian results are not enough better to warrant such radicalism. Dorant has shown that only 32 per cent of placenta previa babies are really at term. Cæsarian section would be contraindicated if the patient had been exposed to many examinations by doctors or midwives outside the clinic, or if she had been tamponed, or showed fever. Marked previous hemorrhage, a dead or non-viable baby, and the marginal and lateral cases are all contraindications to the operation. It is essentially an operation to

save the baby, and too much risk must not be taken with the mother to save the baby. E. P. Davis is rather broad in his indications for the operation, as are also Pankow, Krönig, and Sellheim.

Abdominal Cæsarian section for placenta previa is really to-day the pivot about which all the contention is centered. That a primipara with a rigid cervix and a centralis placenta at term should have the operation, we are all agreed. The writer is willing to go a step further and believes that we will see the indication more and more broadened, until either a primipara or a multipara at or near term with a live baby and a placenta previa centralis will be the subject for a Cæsarian section, especially if the cervix seems to offer any degree whatever of dystocia. Just as we offer the border-line pelvic contractions, the chance for a live baby, so should we also when the placenta centralis is encountered.

The writer has performed one Cæsarian section for a combination of placenta previa partialis with transverse presentation and a border-line pelvis in a para II who had lost her first baby at its birth. E. P. Davis reports 17 cases with no maternal and 17 per cent fetal mortality. Pankow reports 38 cases with maternal and fetal mortalities of 2.5 per cent and 2.9 per cent respectively.

The management of placenta previa is therefore a matter of individualization and attention to detail, plus the skill of the operator with the methods at his disposal. The writer's ideas may be summed up as follows:

First, in the private house. Placenta previa with hemorrhage is best treated by either rupture of the membranes or the Braxton Hicks version, the latter being the safest procedure.

Second, in the hospital. Between the sixth and seventh months with a rigid cervix the vaginal Cæsarian is indicated. Otherwise pack for twenty-four hours and then do a bipolar version.

After the seventh month: In the marginal and lateral varieties with live baby try rupture of the membranes first, and if bleeding is not controlled introduce a bag.

In the partial and central varieties with a live baby use the bag. If the baby is dead or dying use the bipolar version. In any case after the seventh month, if the mother is weakened by the loss of blood the Braxton Hicks version is the method of choice.

In the centralis variety at or near term, with a live baby and mother in good condition, if the cervix seems to offer any degree of dystocia abdominal Cæsarian is the operation of choice.

Perforate all dead babies. Forceps should rarely be used, and only after the head has passed through the cervix. Never do an extraction either immediately or later after Braxton Hicks version. Always let the patient deliver spontaneously.

IRITIS.

In the *London Practitioner* for October, 1915, ORMOND, Ophthalmic Surgeon to Guy's Hospital, states that atropine should be used in cases of iritis until the pupil is fully dilated, or until the drug ceases to produce any further dilatation. A solution of sulphate of atropine (gr. iv in oz. i) usually produces the maximum effect, if instilled liberally at intervals. The use of the pure sulphate of atropine, in the form of crystals placed inside the conjunctival sac, does not produce any better effect than that obtained by the gradual dilatation effected by the 4 grains to the ounce solution applied over a longer period, and the latter has the advantage that it is less likely to produce toxic symptoms.

When using the solid crystals, the lacrimal duct must be kept closed by pressure. The use of atropine must be continued as long as the eye shows any inflammatory symptoms, and for absolute safety a few days longer. It is not, however, necessary to use a stronger solution than is just sufficient to keep the pupil dilated after full dilatation has been obtained. A solution of 2 grains to the ounce is usually amply sufficient for this, if instilled twice or thrice daily.

If atropine irritation ensues, the drug should be discontinued, and homatropine

and cocaine substituted. Duboisine sulphate and scopolamine hydrobromate, in one-per-cent solutions, are other mydriatics which can be used instead of atropine.

The reason for using a mydriatic in iritis is, that by it the hyperemia is diminished, and the adhesions or synechiæ between the iris and the anterior surface of the lens are broken down.

If the iritis can be traced to a definite and specific poison, the treatment will naturally be assisted materially by administering appropriate remedies for the cause; but there are cases in which a definite specific cause cannot be ascertained, so that the so-called idiopathic cases still remain. In these cases mercury is always indicated, since it is an antiseptic, and iritis always suggests the presence of a poison within the system; mercury has, too, an undoubted influence on all inflammatory conditions, whatever their cause.

Diaphoresis combined with mercurial inunction is most valuable in all syphilitic and idiopathic cases. The patient should be recommended to take three very hot baths each week just before bedtime, and to continue these for a period of three or four weeks; after the bath a drachm of the unguentum hydrargyri oleatis should be rubbed into the skin, until the ointment disappears. The patient should be warned against rubbing the ointment into the same place more than once a fortnight. The armpits, bends of elbows and knees, the groins, and small of back are all suitable places for applying the drug.

In the early stages of acute iritis, especially of the gonorrheal variety, pain is often severe. A solution of dionin, 1 to 2 per cent, combined with cocaine and adrenalin, instilled into the conjunctival sac, is very useful for this symptom. Leeches, or small blisters, applied to the temple sometimes act like magic, and hot lotions are also beneficial.

Cases of iritis, especially those occurring in men accustomed to an active independent life, often produce a very irritable condition of mind, followed by great depression, the result of the pain, partial blindness, and resultant dependence on others. To combat this, the patient should be allowed carriage exercise, and be kept as far as possible in cheerful surroundings. The photophobia is sometimes very distressing, but in no case should all light be cut off from the sick-room. Smoked glasses and a broad shade should be sufficient to protect the patient, and for the sake of the nurse and the patient's friends, as well as for his general health, the room should not be in total darkness.

All stimulants should, as far as possible, be avoided, as well as meat. The diet should be liberal, but easily digestible. Constipation must be prevented, and treatment should start with a brisk purge.

Tuberculous iritis is very chronic, and treatment must be carried out for a long time, in some cases even as long as two or three years. In intractable cases, subconjunctival injections of 1 Cc. of a one-per-cent solution of guaiacol are useful. Tuberculin should be used in all cases, but in association with general and local treatment. In gonorrheal cases, the local treatment of the urethritis should be carried out; for the pain, which is usually of a severe kind, dry heat is most satisfactory. This is best applied by means of "hot coil," which consists of a small electric resistance in the form of a flexible pad which can be bandaged on the eye so that it is possible to apply a constant dry heat for a period of half an hour or an hour two or three times a day. Leeches applied to the temple are unsurpassed as a remedy for the intense pain due to congestion, and blisters to the temple are sometimes useful. With regard to the syphilitic cases, as the writer has said before, the local treatment is generally very satisfactory; atropine acts rapidly, and usually prevents the formation of adhesions, whilst reducing those already formed. Treatment should be carried out vigorously, but the writer would not advise the use of "606" in the acute stages, for he has had one or two cases in which a severe neuroretinitis has resulted from its use. He thinks it advisable to use this very valuable remedy after the acute condition is over, and to be content with

the employment of mercury during the inflammatory stage.

In conclusion, he says that iritis is commonest in young men and adults, and that undoubtedly 75 per cent are due to venereal disease. Tubercle and infective diseases are causes which do not account for more than 25 per cent.

ACTION OF THE OPIUM ALKALOIDS, INDIVIDUALLY AND IN COMBINATION WITH EACH OTHER, ON THE RESPIRATION.

MACHT in the *Journal of Pharmacology and Experimental Therapeutics* for October, 1915, when summing up the action of the opium alkaloids on the respiratory function, states that these drugs may be broadly divided into two classes. On the one hand is morphine, which is the great sedative alkaloid, although in small doses it may not interfere with efficient respiration, and may even improve it. On the other hand there is narcotine, papaverine, narceine, thebaine, and cryptopine, which are all distinct stimulants and in large doses excitants of the respiratory center. Codeine belongs to the morphine class, though in large doses it may also excite the respiratory center, especially in rabbits.

The rate of respiration is markedly slowed by morphine, the number being on the average diminished one-third by moderate doses of the drug. Codeine also slows the respiration, but to a much less degree. Narcotine and papaverine decrease the rate but slightly; the other alkaloids not at all, and may even increase it.

The action of combinations of these alkaloids on the respiration can be completely explained as a summation of their individual properties. In this way it was found that morphine plus narcotine, morphine plus papaverine, and a mixture of the total opium alkaloids are less depressant to the respiratory center than morphine alone. This was corroborated by Hooker's method of studying the effect on the center directly, by perfusing an animal's medulla, apart from the general circulation. On the bronchi narcotine and papaverine have a dilator action, morphine and codeine also, but to a less degree, and the other alkaloids none at all; furthermore the effects of morphine and narcotine seem to neutralize or antagonize each other.

1. Of the primary opium alkaloids, morphine and to a less degree codeine are sedative or depressant, while narcotine, papaverine, narceine, thebaine, and cryptopine are stimulating to the respiratory center.

2. The action of combined opium alkaloids is a summation of their individual effects.

3. On the bronchi, narcotine and papaverine are dilators, morphine is a dilator to a less degree, codeine still less so, and the other alkaloids not at all. Morphine and narcotine seem to act antagonistically on the bronchi, their combined effect being a lesser dilatation than that produced by each of them individually.

4. It is hoped that the above findings will contribute to a more rational therapeutic use of opium and its derivatives.

STUDY OF THE NON-TUBERCULOUS INFECTIONS OF THE RESPIRATORY TRACT, WITH SPECIAL REFERENCE TO SPUTUM CULTURES AS A MEANS OF DIAGNOSIS.

In the *Archives of Internal Medicine* of October 15, 1915, LUETSCHER publishes a paper which, although diagnostic in its nature, has so important a bearing on treatment that an abstract is appropriate in a journal devoted to therapeutics.

1. Sputum cultures have been neglected because of the confusing results obtained, and the mixture of organisms found.

2. These results are due to unsuitable mediums and bacteriological methods.

3. By means of fresh blood agar plates, practically pure cultures can be obtained in 95 per cent of the acute non-tuberculous infections of the respiratory tract of adults.

4. The pneumococcus is the cause of 62.44 per cent of all the non-tuberculous infections below the larynx, and the influenza bacillus in 28.5 per cent. These two organisms cause 90.94 per cent of the infections of the bronchi and lungs; 74.96 per

cent of the infections of the larynx; and 31.29 per cent of the infections of the nose, throat, and sinuses.

5. The streptococcus, contrary to common belief and text-book reports, is only rarely the cause of infections in the lungs, and when found is usually associated with complications such as lung abscess, bronchiectasis, carcinoma, etc. In infections of the head, however, it assumes the predominant rôle, especially in the tonsils.

6. The staphylococcus aureus was never found to be the cause of the acute infections of the lungs or larynx, and only once was it found in acute coryza and acute sinusitis.

7. The micrococcus catarrhalis may cause rhinitis, laryngitis, acute bronchitis, and acute bronchopneumonia. It was found in pure culture in three out of thirty-seven cases of acute rhinitis, five out of thirty-eight cases of acute laryngitis, and in one each of acute bronchitis and primary bronchopneumonia.

8. The colon and typhoid bacillus rarely if ever produce acute lesions in the lung. The typhoid bacillus, however, may produce lung abscess following an infarct.

9. There is a unity of infection of the respiratory tree. The same organisms which cause the infections of the bronchi and lungs also cause the infections of the nose, sinuses, and larynx.

10. Sputum cultures afford an easy, quick, and reliable method of diagnosis of pulmonary infections. Since the blood cultures are negative in 70 per cent of the cases of pneumonia and negative in nearly all of the other infections of the respiratory tree, it is practically the only means of making an etiological diagnosis in the non-fatal infections.

11. This etiological diagnosis is necessary for a rational advance in prophylaxis and specific therapy. It is also a great aid in making an early diagnosis, and helps us to give an intelligent prognosis. This is especially desirable in private practice.

12. By means of these cultures we have also obtained a wider knowledge of what lesions a given organism may produce. These cultures show that each organism may produce a variety of acute lesions. Especially valuable information is afforded in that they show that influenza bacillus and pneumococcus may produce chronic lesions extending over many years. This has an especial bearing on differential diagnosis, in regard to whether or not a given chronic chest condition is tuberculous.

INTESTINAL STASIS AND INTESTINAL INTOXICATIONS: A CRITICAL REVIEW.

In the *Journal of Laboratory and Clinical Medicine* for October, 1915, WOOLLEY reaches these very wise conclusions:

1. Absorption of poisonous materials from a healthy bowel has not been shown to produce symptoms of disease.

2. Absorption of bacteria and other substances from an unhealthy bowel may produce serious symptoms.

3. A surgical operation for intestinal stasis is not justifiable except as a last resort.

4. There is no definite information in the literature to show that surgical procedures, made for intestinal stasis, have been more successful than medical (including hygienic) ones.

5. Many cases in which symptoms are attributed to intestinal stasis are suffering from focal infections entirely outside the intestinal tract. Such infections are illustrated by pyorrhœa alveolaris, chronic tonsillar infection, and chronic infections of the antra and sinuses of the head.

THE INFLUENCE OF SALICYLATES ON THE ELIMINATION OF URIC ACID AND OTHER WASTE PRODUCTS FROM THE BLOOD.

In the *Journal of Pharmacology and Experimental Therapeutics* for October, 1915, DENIS concludes that sodium salicylate and aspirin administered in the large doses frequently used in the treatment of acute rheumatic fever cause the uric acid content of the blood to be markedly reduced, a result which up to the present time has been shown for only one other drug—*i.e.*, phenylquinolin

carbonic acid (atophan). Most of the patients used in the work had blood giving non-protein nitrogen values but little above normal; in these the administration of salicylate had no effect on this fraction. In two or three cases, however, the non-protein nitrogen was abnormally high, and in these cases a considerable diminution of the fraction took place after the administration of the drug.

In the three cases in which large doses (7 grammes) of sodium salicylate were given for one day only, one showed no change in the uric acid content of the blood, while the other two showed a reduction comparable in size to that obtained in the first eight cases in which medication was continued for three days, a result similar to that obtained by Fine and Chace by means of atophan.

The smaller doses of sodium salicylate used in two experiments were apparently without much effect in producing either an increased output of uric acid in the urine or a decreased content in the blood.

From the few cases in which the writer has been able to obtain a third sample of blood some days after the administration of salicylate had been stopped it would seem that as soon as the drug is withdrawn the accumulation of waste products recommences, a finding which is in accord with the long-known fact that after the administration of salicylate is discontinued the output of uric acid in the urine is frequently diminished below the level at which it stood previous to giving the drug.

From the foregoing results the increased output of uric acid following salicylate medication is clearly due to a lowered threshold value of the kidney, not only for uric acid, but in all probability for other waste products as well. Such being the case, it may well be that the beneficial effects resulting from the use of salicylates in acute rheumatic fever may, in part at least, be due to a power possessed by this class of drugs of increasing kidney permeability, thereby facilitating the rapid and more or less complete excretion of the as yet unknown toxins which produce symptoms of these diseases.

THE TREATMENT OF CEREBROSPINAL SYPHILIS BY MERCURIALIZED SERUM.

The resistance of tabes, tabo-paralysis, and general paralysis to antisyphilitic treatment has long been the despair of the syphilologist and the neurologist. It is true that in cases which are not too far advanced some improvement occasionally occurs after intense mercurial treatment, but the great majority of cases are not amenable to antisyphilitic drugs when administered by any of the ordinary routes; indeed, some authorities have stated that these conditions are made worse by such treatment. Tabes, tabo-paralysis, and general paralysis were therefore regarded as parasyphilitic affections, and, although syphilitic in origin, beyond the scope of antisyphilitic treatment.

The discovery by Noguchi and others of the Spirochæta pallida, in its typical form, in the brain of general paralytics and in the spinal cord of tabetics threw a new light on the pathology of these affections and gave cause for hope for further success in treatment. It appears that they must now be regarded as cases of true cerebrospinal syphilis and not parasyphilis. Mott introduced the term "parenchymatous syphilis" to distinguish them from cerebrospinal syphilis of vascular origin. To explain the failure of mercury and arsenic to influence parenchymatous syphilis, when introduced by the usual routes, it has been suggested that the cells covering the choroid plexus exercise a selective action and do not allow these drugs to pass from the general circulation to the cerebrospinal fluid. The method of direct intraspinal treatment introduced by Marinesco was founded on this hypothesis. Both a dilute solution of neosalvarsan and serum taken from a patient after intravenous injection of salvarsan or neosalvarsan have been used. The latter method is assumed to depend on the presence of antibodies in the serum, produced by the preliminary intravenous injection of salvarsan, since the amount of original or altered salvarsan present in the quantity used for intraspinal injection must be infinitesimal. Owing to the irritation caused

by direct injection of the arsenical preparations treatment by "salvarsanized serum" has obtained most support. Swift and Ellis, of New York, in 1912, tried this method in cases of tabes, and the following year Robertson of Edinburgh used it in general paralysis. Since then intracranial injections have been tried in general paralysis.

The results of treatment by salvarsanized serum in parenchymatous syphilis are doubtful, although temporary improvement has been reported by several observers. The question naturally arises whether better results could not be obtained from the use of intraspinal injections of mercurialized serum or some preparation of mercury. This question has recently been studied by C. M. Byrnes, of the Johns Hopkins University, who, after a year's unsatisfactory experience with salvarsanized serum, has devised a method of treatment by what he terms "mercurialized serum." In the preparation of this serum Byrnes employs albuminate of mercury, for the reason that this is the form in which mercury is supposed to exist in the blood after ordinary mercurial treatment. When an inorganic salt of mercury comes into contact with albumin, coagulation occurs with the formation of albuminate of mercury. This is soluble in excess of albumin, so that the addition of more serum forms a clear solution. It was found that approximately 0.02 gramme of mercuric chloride solution added to 2 Cc. of serum caused complete precipitation, and that 4 Cc. of serum was required to dissolve the precipitate. Thus 6 Cc. of serum will hold 0.02 gramme (1/3 grain) of mercuric chloride converted to albuminate in solution, a larger quantity than is required for therapeutic purposes. After experimenting with very small doses, Byrnes found that 0.0013 gramme (1/50 grain) or even 0.0026 gramme (1/25 grain) could be given safely. The technique is as follows: (1) Sufficient blood is withdrawn to yield from 12 to 30 Cc. of serum; this is centrifuged and the serum removed; (2) 1 Cc. of a solution of mercuric chloride in distilled water, made to contain 0.0013 gramme to 1 Cc., is added to 12 Cc. of serum; (3) to the serum thus prepared is added salt solution up to 30 Cc., if diluted serum is to be used; if a concentrated solution is required this is omitted; (4) the mercurialized serum is heated to 56° C. for half an hour; (5) lumbar puncture is performed with the patient in bed; pressure readings are taken, and the spinal fluid withdrawn till the pressure falls to 30 mm. The serum is then administered by gravity at body temperature, and the foot of the bed raised.

Byrnes has used this method in 32 cases, comprising 13 of tabes, 14 of general paralysis, 2 of tabo-paralysis, and 3 of cerebrospinal syphilitic meningitis. In tabes there was improvement in the gait and also in the gastric and bladder symptoms. Some cases of general paralysis were also improved, and in one case of tabo-paralysis the grandiose ideas are said to have disappeared, and the mental state of the patient to have become apparently normal. Favorable results were obtained in the cases of meningitis. The diminution in cell elements of the cerebrospinal fluid was more rapid than after treatment by salvarsanized serum.

It will be noted that Byrnes's method by "mercurialized serum" differs from that by "salvarsanized serum" in that it consists of direct treatment by means of a preparation of mercury dissolved in serum, instead of indirect treatment by serum containing hypothetical antibodies. In this respect it would appear to be the more rational form of treatment, for the quantity of mercury present in serum withdrawn from a patient after intense mercurial treatment has been found to be quite insignificant, and the amount of antibodies present in such serum must be problematical. It also has the advantage of being a simpler procedure, since it avoids the preliminary intravenous injection required for salvarsanized serum.

The introduction of mercury into the subdural space had been previously tried by Ravaut, who used the perchloride and the cyanide in two cases, but the results were disappointing. This led Byrnes to seek for a non-irritating preparation similar to that in which mercury circulates in the blood (albuminate). In the usual doses this form

of mercury was found to be quite as powerful as the inorganic preparations, and it has since been used for intravenous injection in ordinary cases of syphilis by L. Thompson, who regards it as a useful method when rapid results are required. The initial dose given in his cases corresponds to 1/12 grain of mercuric chloride, and this was increased to 1/3 grain. Further results of this form of mercurial treatment will be awaited with interest.—*British Medical Journal*, Sept. 25, 1915.

CARDIOVASCULAR-RENAL DISEASE (ARTERIOSCLEROSIS).

BISHOP, in the *Medical Record* of Oct. 9, 1915, states that it is his experience that practically all well-advanced cardiovascular-renal sufferers are sensitive to meat proteins, that nearly all are sensitive to fish proteins, and that a large part are sensitive to egg proteins. The single exception seems to be with the flesh of fowl, which is tolerated by many who cannot tolerate meat or fish. [We would like to have the reasons for such a view.—ED.]

In the presence of severe disease all eggs, fish, meat, and stock soups should be excluded. This leaves a much wider dietary than would at first be supposed.

After disposing of the supposed gastric origin and the uric-acid origin of the disease, there are still practically all the fruits, vegetables, cereals, fats and oils, with every kind of milk product. Exclude only things which the individual finds from actual and repeated experience to disagree with his stomach.

Alcohol is not specifically harmful, though its side effects are unfriendly to any systematic hygienic treatment.

Tobacco is a matter of individuality. A few people are profoundly sensitive as to their cardiovascular system to tobacco. Most people can use it in moderation.

The second indication of treatment, founded on the belief that all these examples of degenerative circulatory disease are in their ultimate analysis examples of chronic food poisoning, is attention to the intestinal tract, particularly as to the elimination of stagnating material. For this purpose the good and tried remedy, castor oil, is so much better than any other that the writer uses it almost exclusively, and as nearly as possible in its pure form.

In starting treatment of a person with cardiac pain, high blood-pressure, and albuminuria, he gives a full ounce of castor oil every other day for three days, then at the end of a week, then in two weeks, then in three weeks, and follows this by a monthly dose as the rule for a long period of time.

The third element in treatment of the disturbance of metabolism that is the underlying cause of cardiovascular-renal disease is found in exercise. Exercise constitutes the best cardiac stimulant, the best pulmonary excitant, and the best remedy for intestinal inactivity. The writer is accustomed to tell people with high blood-pressure that bodily fatigue judiciously obtained out-of-doors is the best antidote for that condition.

To sum up his conception of the nature and treatment of cardiovascular-renal disease it may be said that we must seek the underlying cause of the disease in the ultimate cell. We must regard the organic changes as the result of the progress—not as the disease itself.

In treatment we must primarily treat the disturbed metabolism by cutting off the source of irritation in proteins to which the individual is sensitive, by a diet to which the writer has given the name "the few-protein diet," because it implies the complete elimination of irritating proteins rather than the diminution of their quantity, the recognition of exercise as the best cellular and organic stimulant, and the use of castor oil as the best single remedy.

In addition to these things we will bring to bear on the treatment of the individual organs such methods as are needed and as our judgment dictates.

Space does not permit of the discussion of the place of iodide of potassium, nitroglycerin, digitalis, hydrotherapy, and many other implements of the art of medicine that are appropriate.

The great enemy of the cardiovascular-renal patient is the supposed specific,

whether it be electricity, radium, some fantastic combination of salts, or the latest fashionable combination of iodine. The road to restored health is rugged and beset with discouragements, but the comfortable byway offered by the supposed specific has led to the subtraction of many years of life from persons who have been so unfortunate as to rely on them to the neglect of essentials of treatment.

The cure resort, as exemplified by the cures of Europe and now by our own Saratoga, makes the strict regimen much pleasanter to carry out, though many cures are constantly being successfully conducted by people in their own homes. The sufferer from cardiovascular-renal disease is often the most valuable citizen in his community, and much more worth saving than those liable to succumb to infectious diseases.

TREATMENT OF RHEUMATISM.

MACRAE SMITH in *Northwest Medicine* for October, 1915, says that as the principal characteristic of rheumatism is the arthritis, some local application must be found which may be rubbed in. This gives a certain amount of physical relief to the patient and an equal amount of mental relief to his friends. For this purpose the writer finds that oil of wintergreen, either pure or as a liniment or ointment, gives considerable help. Menthol and belladonna are not quite so useful. Rest to the joint gives the greatest amount of relief. This may be obtained by wrapping it well in cotton and using a splint, or by applying a light plaster-of-Paris cast.

The writer had not thought of the value of a plaster cast until he read a few years ago a paper by Dr. Rich of Tacoma, Washington, describing the advantage of this line of treatment. Subsequently the writer tried it a number of times and found it most efficacious in relieving pain, owing to the limitation of movement and prevention of jars. It is best applied by wrapping the joint well in cotton, putting on the cast and splitting it. Then no increase in swelling causes harm or pain from pressure. This can be left on a few days, but must not be permitted to remain too long; if left there during the chronic stage it is possible to obtain permanent stiffness and even ankylosis.

It is from internal medication, however, that the greatest relief is obtained, and this is so constant in the case of salts of salicylic acid that they may almost be termed specific in their action. For this purpose it is best, the writer believes, to use the natural acid, although many affirm there is no difference. It must be given in large doses at first—that is, 15 to 20 grains every four hours. He usually combines it with some pepsin preparation in order to lessen the irritation of the stomach. It may be combined with soda bicarbonate, but the writer prefers to give any alkali entirely separate in the form of potassium acetate, gr. xv t.i.d., until the urine becomes highly alkaline. This dose of salicylic acid or sodium salicylate he continues until the pain is gone or the ears begin to ring, when he cuts the dose in two and usually finds that sufficient. If the salicylate be continued it may produce deafness and some of the cutaneous irritations. In the ordinary case he gradually tapers off the dose. During the whole course of the disease special attention must be paid to the bowels, and for this purpose the salines are of the greatest service—Epsom or Rochelle salts, or any of the aperient waters, may be used. Care must be taken, however, not to weaken the patient by purgation.

If the disease be a mild one, we may hope for cure in about three weeks. Relapses unfortunately are frequent. It may be found necessary to use massage for the affected joints and to rub them with stimulating liniments, and, if they remain obstinate, blisters, counter-irritation of various kinds, and even the application of dry heat, raising the temperature to some 400° F., in an effort to produce free movement.

The internal administration of potassium iodide is of the greatest help in these chronic cases, either alone or combined with the salicylates. For the severe pain aspirin will be found to give more relief than any of the other forms of the drug, but must be given

in large doses. Many advise much larger doses than the writer would care to give, for while he gives 5 grains and usually combines it with an equal amount of phenacetine, we may give ten, fifteen, and even twenty grains. Aspirin is a little less irritating to the stomach than salicylic acid, and a little more irritating than salol.

As soon as the fever goes the writer begins the use of iron, preferably Blaud's mass, and continues it long after the arthritis has completely disappeared. He considers this one of the most important parts of the treatment. It lessens the danger of relapse and also counteracts the tendency to cardiac complication by increasing the general resistance. Arsenic in the form of Fowler's solution may be used, especially if there be any tendency to a choreic complication; in the ordinary case, however, he rarely uses it. Quinine is of value, but mostly as a general tonic, and is used in small dose. Cod-liver oil is one of the very best medicines in the chronic stage, and in such cases is of more value even than iron. He would continue it for a long time, sufficiently long to improve the patient's general health markedly.

PERMANENT BRADYCARDIA AND ATROPINE.

The *British Medical Journal* of September 25, 1915, states that E. COTTIN (*Archives des maladies du coeur, des vaisseaux, et du sang,* June, 1915) describes two cases of bradycardia—one of organic, the other of nervous origin. The second case is of much interest in view of the fact that up to quite recently it was generally held that true bradycardia of nervous origin was always paroxysmal, never permanent. The first case presented no very special features. The patient was a man seventy-two years of age, suffering from cancer of the stomach. The pulse-rate varied between 38 and 40 per minute, and was regular. A series of tracings were taken. The auricles contracted at the rate of 85 a minute, and all relation between the contractions of auricles and ventricles was broken. Atropine had no effect upon the contractions of the ventricles, nor indeed upon those of the auricles. The absence of effect upon the auricles diminishes the value of the atropine test, but the same phenomenon has been observed by other workers, and in this it may have been concerned with the advanced age of the patient. At the autopsy the auriculoventricular bundle of His was found to be completely invaded by a dense sclerous tissue, and, in addition, a small calcareous area was found at the level of the auricular origin of the ventriculoauricular bundle.

The other patient was a woman thirty-four years of age, who, since the age of nineteen, had been subject to so-called nervous crises. From about the same age also a gradual progressive enlargement of the thyroid gland had been observed. The slow pulse-rate was first noticed when she was twenty-six years of age. At that time the pulse-rate was found to vary between 45 and 55 per minute. Four years later she came under the care of Professor Bard. The pulse-rate was now between 45 and 50; from time to time an extra-systole occurred, and at times extra-systoles were frequent. The heart was not hypertrophied. The upright position, movements, and quick walking had a hardly perceptible and very transitory effect in quickening the pulse-rate. The venous pulse was very apparent, especially in the left jugular vein; sometimes there were three to four rises of the jugular vein to each cardiac contraction, sometimes there were small rises during the ventricular pause, and sometimes a sharp rise due to the simultaneous production of both contractions. At first sight the case appeared to be one of total auriculoventricular block, but careful examination of the two tracings taken at this period showed that the block was incomplete. In one tracing there was a ventricular response to all the auricular contractions. In the second, taken a few minutes later, the ventricular beat was at the rate of 38 a minute, the auricular about 85. The rise S of the venous pulse was each time preceded by a wave P, so that the ventricular contraction was provoked by an auricular contraction, but, in addition, small rises were observed, which corresponded to auricular contractions without any ventricu-

lar response, and at one time there was a sharp rise consequent upon the superposition of the auricular on the ventricular contraction. The interval of transmission, P-S, was very irregular in both tracings, and in one was found to increase from one cardiac revolution to another, until a length of twenty-six-fiftieths of a second was reached instead of the normal ten-fiftieths, thus showing a disturbance of conductivity. One of the tracings showed the presence of extrasystoles not followed by a compensating rest, a condition of things which Galleverdin considers to occur only in cases of total block, but which in this case occurred during the period of incomplete dissociation only. At this time the patient suffered from attacks of vertigo and semisyncopal attacks. Later, as in most cases of bradycardia, especially those of cardiogenic origin, the disease entered upon a second phase, in which tracings showed the dissociation to be complete and permanent. The syncopal attacks still persisted, but became slightly less frequent, were of longer duration, and were accompanied by total loss of consciousness. During this stage tracings were taken a few minutes and forty-five minutes respectively after the injection of 2 mg. of atropine sulphate. In the first tracing the ventricle was beating at the rate of 38, the auricle at 93, and the independence between the two cavities of the heart was evident and complete. In the tracing taken after forty-five minutes no sign of block remained. The rate of contraction of both auricle and ventricle was 85; the interval P-S had become uniform and did not exceed the normal length. The effect of atropine was the more striking since movements, walking, fever, all of them causes which lead, as a rule, to quickening of the pulse, had always been without marked influence on the heart rhythm.

In this case the bradycardia was undoubtedly of nervous origin, but it is not easy to localize the nervous lesion. The author is inclined to attribute it to excitation of the pneumogastric nerve, possibly due to pressure, direct or indirect, by the goitre from which the patient had suffered for years. Extirpation of the goitre would have decided the point, but the patient energetically refused any kind of surgical intervention.

OBSERVATIONS ON THE USE OF PITUITARY EXTRACT.

In the *Medical Record* of October 9, 1915, BANDLER recalls that when an extract of the pituitary gland is injected during labor it stimulates uterine contractions, increasing all the various powers of the uterus to such a degree that we have a perfect right to say that the secretion of this gland is responsible for labor. This secretion, injected before labor has begun, has little influence except to produce a painless contraction. What new relation between the various glands occurs just before labor, or what inhibitory influence is released, or what new secretion is introduced, is as yet not definitely known.

When we inject pituitary extract, we are injecting a secretion normal to the body. When we inject it during labor, let us take it for granted that we are simply increasing the amount of this secretion, and hence simply bringing its activity up to the maximum that is available. The most that it does is to make the uterus behave as in the typical normal forms of labor. It makes the uterine contractions effective. The patient has pain, the usual amount of pain is often increased, but the patient has genuinely valuable uterine activity. There is no toxic effect. There is no injurious influence on the patient's general systemic state.

The drug is put up in ampoules. A hypodermic of a complete ampoule produces a too forcible uterine contraction. A third or half an ampoule is sufficient at any one time. The effect wears off at the end of half an hour. If a patient in the preliminary stages has regular or irregular pains or discomforts, and is actually in the first stage of labor, even though it be extremely sluggish, injections of pituitary extract prove them to be real labor preliminaries by changing them to regular forceful rhythmic contractions.

Now with these facts before us it is a very simple thing to decide as to the value

of pituitary extract, when it should be used, and how it should be used. The writer puts the statement in a few words. Whenever at any stage of labor progress is slow (when conditions are normal), whenever labor pains are ineffectual (when conditions are normal), whenever labor pains become sluggish, or cease, or uterine atony supervenes (when conditions are normal), pituitary extract, in single or frequently repeated doses, makes the case behave like a normally progressing labor.

Now, what is meant by the statement, "When conditions are normal?" By this is meant that the position and the presentation and the relation between the fetal parts and the bony pelvis are such that a live baby may be expected with a fair degree of certainty.

In the first stage in primiparæ the head must be firmly engaged in and through the brim, and the head must be well molded. If the first stage proceeds too slowly under such conditions pituitary extract is indicated. After the cervix is completely dilated and the membranes are ruptured, and the well-molded head is through the brim, pituitary extract may and should be given when progress is slow. These observations are directed particularly to the labor in a primigravida. In the third stage pituitary extract aids in the expulsion of the placenta, although for this purpose the writer is accustomed to use ergot and the Credé method.

In discussing the first stages of labor, the attention of most men is fixed upon the elements of dilatation of the cervix. Very little stress is laid upon the fact that the head must be firmly engaged in the brim and must be gradually molded so that it may make its way through the bony inlet. If the head is molded, after being firmly engaged, as labor pains continue, the element of dilatation of the cervix itself can more readily be controlled than if the reverse were the case. We are here confronted with a condition very much like that in dry labor, where the molding of the head and its gradual propulsion by the uterine contractions serve to dilate the cervix even more slowly than were the membranes still intact. Hence, an all-important factor in the use of pituitary extract is that we must be sure of our proportions. We must be sure that the head is fixed and molded, and can pass through the brim without very great effort. If this is the case, and if then the cervix dilates slowly, or the further propulsion of the head goes on too slowly, the use of pituitrin in small doses will exert the most marked hastening effect upon the progress of the labor.

Pituitrin is very much the same as gasoline to an automobile. The more steadily we feed the automobile with the least amount essential to each speed, the greater is the effect. Pituitary extract, granted that all other conditions are normal, will aid the first stage, and will benefit markedly the propulsion of the second stage in primigravidæ. In multiparæ the effect is most remarkable in many cases, even when the head is not engaged in the brim, when the previous history shows that labor had progressed normally, and when there is no disproportion between head and pelvic bones. Labor is not infrequently completed; that means dilatation of the cervix, rupture of the membranes, expulsion of the child, in fifteen minutes after the first or second injection of pituitary extract.

In women who have already had children, and in whom there are no bony malformations, the writer uses pituitary extract as soon as well-recognized labor pains are present, and if the pains are irregular and not definitely diagnosed as true labor pains, pituitary extract is used to make this diagnosis. Bandler's experience has been that in multiparæ, with the aid of pituitary extract, the average duration of labor is two hours after he has reached the bedside.

Now, what has pituitary extract done for the obstetrician who uses it in the way the writer has mentioned above?

It has given him the opportunity of determining whether the so-called false labor pains are false or true ones, and they are often true ones. It has enabled him to shorten the duration of labor in primigravidæ and in multiparæ to a most decided

degree. It has cut down the need for the application of forceps to such a degree that their use is scarcely ever indicated except in emergencies. It has almost entirely removed from the field of consideration long and protracted labors due to uterine inertia (emphasis on "due to uterine inertia"). It has given a much greater degree of certainty against the probable or possible occurrence of postpartum hemorrhage.

Let the writer say a few words about Cæsarian section. As soon as the incision in the abdominal wall is begun the patient receives a hypodermic of pituitary extract, one ampoule. As a result, as soon as the fetus and placenta and membranes are delivered the uterus contracts so decidedly that the sewing is readily accomplished, the loss of blood from the wound surfaces is absolutely *nil*, and the bleeding from the uterine lining is remarkably slight. He repeats these hypodermics in similar doses for several days after the operation.

In abortions and miscarriages pituitary extract has no wonderful action in contracting the uterus, and the writer does not rely upon it entirely, using it and ergot alternately during the curettage or the emptying of the uterus. He uses both alternately to secure a proper involution after emptying of the uterus. With the ovum still intact, he relies on the packing of the uterus and vagina, and then uses pituitary extract and ergot alternately.

Of what value is pituitary extract to the gynecologist?

The writer has used this drug in a large number of cases of menorrhagia and metrorrhagia not dependent upon growths or overgrowths in the uterus. He has given one ampoule daily, or on alternate days, for weeks at a time, and has rarely failed to benefit the patient.

The Dührssen operation is not infrequently followed by a tendency to menorrhagia, due in all probability to congestion. These patients are almost of a certainty relieved of their annoyance by the aforementioned use of pituitary extract.

There is no form of uterine bleeding, except that due to carcinoma, in which the continued use of medication for six or eight weeks can in any way be productive of harm.

Pituitary extract is supposedly a powerful stimulator of peristalsis, and the writer has many, many times seen it work wonderfully in postoperative and postpartum cases. In two instances where catheterization was needed at intervals in patients not in the postoperative or postpartum stage, the repeated daily use of pituitary extract has aided markedly in the restoration to the normal.

Some patients are a little sensitive to this drug, a slight pallor of the face and a little coldness of the extremities resulting, which wear off at the end of fifteen minutes; their occurrence is by no means the rule, but rather the exception. In the obstetric cases the writer has never seen even this annoyance.

MUCOUS COLITIS.

In *American Medicine* for October, 1915, BASTEDO says the treatment must be preventive and symptomatic. It is directed toward the prevention of the accumulation of mucus, and to the removal of the associated conditions, such as colic, constipation, intestinal toxemia, disturbed stomach conditions, flatulence, and depressed general health. He takes up first the treatment of the abdominal pain or colic, and then the treatment of the condition after the attack of colic or when there is no colic.

The treatment for the attack of colic resolves itself into measures to relieve pain and neurotic symptoms, and measures to promote evacuation of the mucus.

The first of these is attained by rest in bed, a large dose of bromide by mouth, one or more hypodermics of atropine sulphate gr. 1/50 and codeine sulphate gr. ½, and hot applications to the abdomen in the form of hot-water bag, poultice or stupe, or a hot bath. On account of habit formation in neurotic subjects, morphine should not ordinarily be employed, but it may be where the recurrence is not frequent and the attack is very severe. The best single drug is atropine.

For the evacuation one may use a large dose of castor oil by mouth, or colonic lavage with normal saline, or a solution of sodium bicarbonate one drachm to one pint, given warm and at low pressure (two feet). It may be impossible to get this up into the colon at first on account of the spasticity, but persistence may result in success, and the result is worth trying for. Irritants should not be employed in the already highly sensitive colon. The castor oil acts by making vigorous peristalsis. This coming from above the mucus tends to separate the mucus from above downward, and to carry it onward past the site of the spasmodic obstruction. With the passage of the peristaltic wave the obstruction spasm is abolished.

After these evacuating measures, or in lieu of them in some cases, it is wise to inject slowly into the colon one-half to one pint of olive or cottonseed oil, to be retained over night. To aid this a towel may be placed over the anus. Often the combination of castor oil by mouth, codeine and atropine hypodermically, and the olive oil injection will result in a deep sleep, with the passage a few hours later of the oil and abundance of mucus, and complete relief with no recurrence for a long time.

The treatment after the attack or in cases without colic is designed to prevent accumulation of mucus, to overcome constipation and intestinal toxemia, and to improve general health.

To prevent accumulation of mucus, one of the best remedies is castor oil once or twice a week, and this may be supplemented by colonic lavage every day for a week, every two or three days for two or three weeks, or longer if deemed necessary, or once a week for long periods of time. For colonic lavage the patient should be on the back, or in refractory cases in the knee-elbow position, to allow the fluid to reach the cecum. Some time preceding the lavage he should have emptied the bowels, as the starting up of the defecation reflexes will prevent proper lavage. The liquid used may be tap water, saline, or sodium bicarbonate one drachm to two pints, of course sterilized (sodium bicarbonate is changed to carbonate by heat). If the mucus is not loosened at the time of the irrigation it may be passed one or several hours later. The writer always considers that an irrigation is a failure if no water is retained to be evacuated later or if the water returns clear at the outset, for obviously in such cases the liquid has failed to get past the descending colon or sigmoid.

To lessen the mucus production, he has tried belladonna or atropine for many days at a time, but without avail. To promote its production, in the hope that this would prevent its desiccation and favor its expulsion, he has tried ipecac, also without avail.

The treatment of the constipation and intestinal toxemia is that of any form of constipation. There should be insistence on a daily movement of the bowels, but restriction of the use of enemata and colon irrigations. The writer has had patients who came to think that any abnormal sensation could be removed only by enema or irrigation, and acquired the habit of using these several times a day. If there is ptosis of the abdominal viscera, or laxity of the abdomino-pelvic walls (and these are exceedingly common), the patient should wear an inelastic binder for mechanical muscles. The writer has called attention to these in an article entitled "Simple Measures in the Treatment of Chronic Intestinal Stasis," *International Journal of Surgery,* April, 1914.

The diet may have to be modified according to the condition of the stomach and upper bowel (achylia, hyperchlorhydria, duodenal ulcer, etc.), but in general at the outset it should be the bland lacto-farinaceous type. Later there may be a gradual transition to a coarser type with much vegetable and fruit. But there should be at all times limitation in the amount of readily putrefactive proteins, as in animal flesh, eggs, beans, peas, and lentils, these being replaced, if possible, by much milk in the dietary. The coarse diet at the outset, as advocated by von Noorden, is likely to give rise to gastric disturbances, particularly flatulence, and it is to be remembered that

an excessive quantity of coarse, indigestible food will do more damage to a sensitive intestine than any mild laxative. Moreover, in a large number of cases there is real inflammation, and this is best treated by the bland diet. But the diet should be ample, and its quantity insisted upon, for these patients are prone to undereat because of a suspicion that this, that, or the other article of food does not agree with them.

The best laxative in these cases is probably liquid paraffin, but this may require to be supplemented with phenolphthalein, cascara, or an aloin, belladonna and strychnine pill each night. Cascara may gripe because of the spastic bowel. Agar-agar may be useful in some cases, but may form too good a medium for the bacterial growth. Salines may be employed for a short time, but not indefinitely as they make an entirely abnormal stool. Drastics should be avoided. Calomel or blue pill is not contraindicated and may be useful as a weekly or occasional dose. The writer has already spoken of the use of castor oil weekly or semiweekly and the colon lavage. Hemorrhoids are a bad complication, as they prevent the use of either castor oil or lavage.

A measure of great value, especially if there is chronic colitis, is the retention of eight to sixteen ounces of olive, cottonseed, or mineral oil over night, every night for a month, a piece of rubber sheeting being placed on the bed and a folded napkin over the anus to avoid mishap. A capsule much in favor and apparently of value is that containing castor oil from 2½ to 10 minims with salol 2½ to 5 grains, given four times a day.

If there is any definite surgical condition in the abdomen such as appendicitis, or cholelithiasis, adhesions, kinks, bands, these should be corrected. In sixty-six cases Mummery found surgical conditions as follows: in 14 adhesions causing kinks or obstructions, in 5 chronic appendicitis, in 2 inflammation of appendages or displacement of uterus, in 7 cancer, in 1 stricture of sigmoid. In persistent cases the bowel itself may have to be treated by surgical measures, viz.: (1) For cleansing and medicating the colon, an artificial opening such as by appendicostomy or cecostomy, for the purpose of permitting daily irrigations through the opening. These must be continued for from six months to two years (Mummery), and the procedure is not, in the author's opinion, a valuable one. (2) For overcoming stasis, such as plication of the cecum, fixation of movable cecum, ileosigmoidostomy, cecosigmoidostomy, partial colectomy, and complete colectomy. The indications for radical surgery and the choice of surgical procedure the writer will not attempt to discuss here.

CHENOPODIUM IN THE TREATMENT OF UNCINARIASIS.

In the *Journal of the American Medical Association* of November 6, 1915, BISHOP and BROSIUS reach these conclusions:

1. The method of administration of chenopodium is simple, and is attended with less inconvenience and discomfort than is thymol. This would give the drug an important place in the field work in uncinariasis.

2. Chenopodium can be given at shorter intervals than can thymol, and a cure can thereby be more quickly established, which gives it a greater economic value.

3. Chenopodium is non-toxic in therapeutic doses.

4. Chenopodium is a more efficient vermifuge than thymol in the treatment of uncinariasis.

HISTOLOGICAL CHANGES IN ARSENIC KIDNEYS.

In the *Journal of Experimental Medicine* of November 1, 1915, PEARCE and BROWN as the result of a research reach these conclusions:

1. The type of renal lesion produced by compounds of arsenic varies widely; while some arsenicals produce changes in which vascular injury predominates, others produce an equally dominant tubular injury.

2. In either of these groups the character and degree of the vascular or tubular injury produced by different compounds show further variation, so that the lesions of differ-

ent arsenicals of the same group are not identical. Each compound of arsenic tested, therefore, produces a lesion-complex in the kidney that is relatively characteristic for that compound.

3. The mode and character of the action of arsenicals are dependent upon the chemical constitution of the compound.

PSEUDOCOXALGIA.

LITTLE (*Clinical Journal,* Nov. 10, 1915) after citing the symptoms of this affection, which are practically identical with those of tuberculous hip disease, notes that the most striking characteristic is revealed only by the *x*-rays, since no one in this country is likely to emulate a German surgeon who in such a condition excised the head of the femur and thus secured an interesting and instructive specimen. In a typical case the upper part of the bony nucleus of the femoral head is shown as a flat surface. Light spots are seen on the head, representing parts more pervious to the rays than the rest of it, or the bony nucleus may even be divided into two or more portions. The neck shows an irregular permeability. The epiphyseal line between head and neck is irregular. Probably these light spots are due to islets of cartilage, such as were found in the only specimen of which an account has been published. The process is a chronic one, lasting for two or three years or even more, by the end of which time the patient has lost his limp, but may be left with some shortening, and some reduction of the range of abduction and of rotation.

The affection is almost always unilateral. There is no knowledge as to etiology, though hypothyroidism is suggested. As to treatment it seems at least desirable to attempt to abduct the thigh and keep it in marked abduction, so that the head of the femur may not take a form, as growth proceeds, which would prevent this movement, when the active disorder is at an end. Therefore as soon as diagnosis is made the thigh should be abducted under anesthesia and fixed in that position by means of plaster of Paris. With a patten or high boot the child on the other foot is encouraged to move about freely. A typical history is that a child between the ages of three and twelve years, apparently in perfect health, begins to limp and perhaps complains of some pain, which, however, is never severe. These symptoms are not very marked, but on examination more characteristic ones are found. Flexion and extension of the thigh on the pelvis are free and painless, but the range of the movement of rotation, especially inwards, is much below the normal, and abduction is well-nigh impossible, except under an anesthetic.

In short, the movements of the joint, which in health are those of a ball and socket, are found to be reduced to those of a simple hinge-joint, such as the elbow.

The lower limbs are equal in length at first, but later there may be some shortening. There is little or no tenderness on palpation of the region of the hip-joint and no tumefaction, but generally it is noted that the great trochanter on the affected side is unduly prominent. This appearance is probably due to slight wasting of the muscles on the affected side, which is a common symptom. The Trendelenburg sign is usually found. This consists in the drooping of the sound side of the pelvis when the patient stands on the foot of the affected side, holding the foot of the sound limb off the ground. In a normal child the buttock will be seen not to drop, but in congenital dislocation of the hip and some other conditions the abductors of the thigh are unable to hold up the pelvis.

Von Pirquet's or other tests for tuberculosis give negative results, unless, of course, there is or has been some tuberculous focus in another part of the body.

Coxa vara must be distinguished from pseudocoxalgia, as must cystic disease of the neck of the femur and congenital dislocation of the hip. The *x*-ray affords the easiest, shortest, and most prompt way of making the diagnosis. Arthritis deformans juvenitis is characterized by pain and a loss of movement in all directions and resultant deformity.

OPERATIVE TREATMENT OF EDEMA AND VARICES OF THE LOWER EXTREMITIES.

D'ORIA (*International Journal of Surgery*, November, 1915) observes that the most frequent seat of thrombosis is the common femoral vein. Up to 1910, 95 patients had been subjected to the Madelung operation, with only about eight recurrences during six months' observation. Simple section of the vein, performed 33 times, gave 30 per cent recurrences during four to ten years' observation; partial saphenectomy, 20 per cent recurrences in 21 cases during four to eight years' observation. Moreschi's operation in eleven cases gave two recurrences during six years' observation.

None of these operative procedures are indicated for thrombotic varices due to typhoid endophlebitis. The superficial venous dilatation in such cases represents channels purposely created by nature through laws of compensation, and should therefore be respected. Biondi operates by interrupting the main arterial current, resecting between two ligatures a small portion of the superficial artery, not disturbing the venous circulation either superficially or deeply. This arterectomy establishes a circulatory equilibrium by interrupting the current in the main artery of the limb, just as the obliterating thrombus had done in the vein.

Two cases are reported, both of a septic phlebitis, followed by chronic edema of the extremities with ulceration, both promptly cured by excision of a section of the artery.

DIRECT TRANSFUSION OF BLOOD.

LESPINASSE (*Chicago Medical Recorder*, October, 1915) notes that there are two chief advantages in using the "iridio platinum tubes," namely: (1) The full lumina of the vessels are maintained; (2) "iridio platinum" is so hard and takes such a high polish that there is no chance for the blood to adhere to it and so clot. The wall of the tube is very thin, 2/1000 of an inch, so that when it is inserted into the blood-vessel there is no diminution in the blood-vessel lumen, consequently the time necessary for transfusion is shortened, and also there is no stagnant pool of blood behind the thick wall of the tube to start a clot. The preservation of the full lumen of the blood-vessel in the tube is a very important factor. At best the radial artery is small, averaging about 2 to 2½ mm. in diameter. If one-half the lumen of the artery is taken up by the walls of the tube inserted into its lumen, the blood flow will be diminished by four, and it will take four times as long to transfuse a given amount of blood.

The radial artery of the donor is dissected out under local anesthesia for about an inch, the small branches are double clamped and double ligated. As the blood is flowing through the artery, its diameter is carefully measured with a mm. gauge. A heavy silk ligature is now passed beneath the artery, and traction is made upon this, pulling the artery out of the wound. A blood-vessel clamp is now applied to the artery in the proximal angle of the wound, and then an artery forceps is applied to the artery in the distal end of the wound; the artery is now severed just proximal to the artery forceps. Immediately the vessel is washed with saline solution, the adventitia is grasped in fine forceps, pulled down, and cut off flush with the vessel end. Next the artery in the grasp of the artery forceps is ligated. While an assistant plays a constant stream of solution on the vessel end, the artery is gently stripped from the clamp at the cut vessel end, thus removing all free blood and clots from the lumen. Three fine sutures, piercing all the arterial coats, are now passed through the arterial end, so that traction upon them will open the vessel end wide. While traction is being made on these guy-ropes, the iridio platinum tube is inserted into the open arterial end and the artery gently ligated to the tube. The same technique is now carried out upon one of the superficial veins of the forearm. The clamp on the vein is removed, then the clamp on the artery is removed, and blood begins to flow.

Blood will flow through iridio platinum tubes indefinitely. Technically, their use is

quite simple. They preserve the full functional diameter of the blood-vessels, hence the time of blood-flow is considerably shortened. They have never failed the author, either experimentally or clinically, in a rather extensive experience.

Clinically direct transfusion of blood is indicated in the following types of cases: Hemorrhagic disease of the new-born; the general class of so-called hemorrhagic diseases, purpura, etc.; in simple blood loss due to stomach ulcer; postpartum bleeding; bladder tumor and trauma; in toxemias of various sorts, either with or without a preliminary bleeding, as uremia, eclampsia, typhoid fever, and pneumonia.

ANASTOMOSIS OF THE VASA EPIDIDYMIS IN STERILITY.

BERNHART (*New York Medical Journal,* Oct. 23, 1915) states that the commonest cause of sterility in men is the occlusion of the lumen of the convoluted tubes of the epididymides. This occlusion, due to bilateral epididymitis, is most frequently found in the head of the epididymis, but it does not, to any material extent, involve the efferent ducts leading from the testicle or the beginning of the vascular cones, the terminal portion of these ducts. An anastomosis then, to be successful, should drain the area lying between the occluded portion of the head of the epididymis and the testicle.

Contrary to common supposition, lack of success in operating is not due to the vas failing to remain patulous, but rather to the fact that the wound in the head of the epididymis has a tendency to close rapidly. The mere insertion of a strand of silkworm-gut or silver wire into the lumen of the vas deferens will not keep open the wound in the gland. This difficulty seems to be readily overcome by the looped wire herein described.

The openings into the vas deferens and head of the epididymis are made as usual. The anastomosing sutures of 00 plain catgut are placed in position, and before being drawn taut the silver wire is in the lumen of the proximal portion of the vas until the loop engages in the wound. The loop is then embedded in the epididymal wound and the sutures are tied. The free end of the wire is brought out of the scrotal wound. The wire is removed in from twenty-four to thirty hours. The wire is bent in such a manner that upon its removal the loop reseparates the adherent wound surfaces in the head of the gland.

The operation should be done under a general anesthetic or by nerve blocking at a distance from the site of the operative field. Local anesthetics, by direct infiltration into the parts, jeopardize operative results because of the distention of the tissues. A close-fitting suspensory bandage is applied immediately after the operation, and the patient is kept in the recumbent position for four to six days.

This technique has proved successful in eight consecutive cases, compared to about thirty per cent of failures otherwise. The wives of four of these patients became pregnant shortly after the operation. In view of the fact that these women had received various gynecological opinions as to the reason for their supposed unfruitfulness and treatment, therefore it might not be amiss to suggest that after a period of barren marriage, if children are desired, the husband be first examined, and then, if necessary, the wife.

PANCREAS STONE COLIC.

EINHORN (*Medical Record,* Oct. 23, 1915) calls attention to the fact that the occurrence of pancreatic stones is rare, whilst recognition of the condition is still rarer during life. He groups the literature as follows: (1) Cases in which pancreatic stones were found at autopsy; (2) cases in which pancreatic stones were found at operation; (3) cases observed clinically, (*a*) without and (*b*) with the presence of undoubted pancreatic stones.

As to diagnosis, he holds that colic-like pains, occurring periodically in the epigastrium, associated with a transient glycosuria, are probably caused by a pancreatic

stone. The sudden disappearance of the symptoms favors the assumption of the passing of the stone. The occurrence of a calculus in the feces, consisting mainly of calcium carbonate and phosphate without cholesterin or bile pigment, points to the pancreatic origin of the stone. At the commencement and for a long time to come the process may not at all interfere with the functions of the pancreas. Only later the presence of a calculus may lead to changes of the pancreatic tissue, which again causes an impairment of the function of this organ. One can see from this what is also clinically confirmed, that a disappearance of the pancreatic function belongs to a later stage of pancreolithiasis and cannot be made use of in any early diagnosis.

The occurrence, however, of sugar in the urine during an attack is of prime importance, although an absence of this symptom would not militate against the diagnosis of pancreatic stone.

As in all other diseases an early diagnosis offers the best opportunity for successful treatment. Just as in gall-stone colic rest during and immediately after the attack is of most importance, the patient is kept in bed, placed upon a light diet, warm applications are made to the abdomen, and if the pains are severe, opium or atropine or both may be given.

Shortly after the attack frequent small meals and the drinking of alkaline waters are indicated. If these measures should not be successful and the attacks become more frequent, or if they become more severe and are attended with a slight rise of temperature, an operation should be advised in order to examine thoroughly the gall-bladder and pancreas. If a stone is found it ought to be removed. If this is not the case—frequently with small stones it is impossible even with the pancreas directly under our fingers to feel them—drainage of the gall-bladder should be done. This must also be done when stones have been found and removed, as one cannot be sure that small stones have not remained hidden. The drainage of the gall-bladder exerts a beneficial effect upon an existing pancreatitis, which we generally find associated with the calculi. Through free drainage the liver and pancreas are eased and the latter organ returns to normal activity.

GUMMATOUS CERVICAL ADENITIS.

COUES (*Boston Medical and Surgical Journal,* Nov. 18, 1915) notes that gummatous cervical adenitis has been thought to be a comparatively rare manifestation of the disease.

The type which offers the greatest interest and difficulty of recognition is that which is the subject of this paper—that is, gummatous cervical adenitis without other obvious signs of syphilis, mistaken in some cases and treated for tuberculous cervical adenitis often over long periods of time without result.

A possible relation between tuberculosis and syphilis is well known to have occupied the attention of many students of both diseases for a considerable time; and we are constantly on the alert in cases of tuberculosis to prove or disprove a previous luetic infection.

In regard to the question of syphilis and tuberculosis, Burzi quotes Nicholas, Favre, and Charlet. In 45 out of 46 cases of syphilis they obtained a positive tuberculin reaction (intradermal), though clinically no symptoms of tuberculosis were found in the patients beforehand. It will be seen that when the results of this examination are at times so equivocal and perplexing, the clinical picture between gumma and tuberculosis may be even more so, and especially where the process is in the cervical lymph glands.

In Fournier's analysis of 3429 cases of various tertiary forms of syphilis there is not a single instance of gummatous cervical adenitis (Wile). He estimated that the total of recorded cases was well under 100.

Up to 1912 only two cases of this condition were reported in the American literature. Most of the cases reported were those occurring at the same time as other tertiary lesions. Wile says that, in his opinion, in the state of our knowledge of the different

granulomata's reaction to mercury and iodide, great caution must be exercised in making a positive diagnosis of syphilis on the clinical signs of improvement, without other data and examinations to judge by. We must bear in mind the opinion of Macleod, and that of Nicholas, Favre, and Charlet, concerning the extreme difficulty and at times the impossibility of distinguishing, microscopically, between syphilis and tuberculosis.

Cases of cervical adenitis supposed to be tuberculous, yet not quite characteristic, should be regarded as possibly gummatous, and careful study with all the means at our command should be made to prove or disprove this supposition definitely. It has been proved that after all the clinician must fall back on consideration of the case with an exhaustive history pertaining to possible syphilis, to arrive at a correct diagnosis.

THE SYPHILIS WE SEE BUT DO NOT RECOGNIZE.

STOLL (*Boston Medical and Surgical Journal,* Oct. 21, 1915) concludes a record of rather suggestive cases as follows:

The late symptoms of lues are often vague, but their indefiniteness should put us on our guard. "Chronic rheumatism" and "chronic headache" mean "chronic syphilis" in many cases. The physician who does not avail himself of all the newer tests before making these diagnoses assumes a grave responsibility. By carefully studying other members of the family some evidence of syphilis may be detected when nothing can be discovered in the patient himself. Of supreme importance is the realization that syphilis is a familial disease. It is a problem for the family doctor, not for the genito-urinary specialist or the dermatologist. Finally, we must not lose all sense of perspective and become blind worshipers at the shrine of Wassermann. Admitting that it is the most valuable laboratory test yet discovered, it is not infallible. Positive in nearly all early cases of syphilis it is often negative in the late cases, especially in adults with a prenatal infection. Even when positive it does not prove absolutely that the lesion in question is due to syphilis. The Wassermann and luetin tests should supplement, not supplant, the complete history and careful examination.

ENLARGEMENT OF THE THYMUS.

GROSSMAN (*New York Medical Journal,* Nov. 27, 1915) reports a case.

The essential symptom of thymic enlargement is respiratory disturbance resulting from the elimination of space in the superior thoracic strait. This respiratory difficulty may manifest itself in all possible grades, from a mild stridor to a severe dyspnea.

The general appearance of the patient is usually that of perfect health. Some patients have adenoid facies.

The throat, as a rule, is negative, although occasional enlargement of the tonsils may be present.

The enlarged thymus may be felt just above the sternal notch, especially during or immediately after a spasm of coughing. An enlarged spleen and enlarged lymph nodes may be associated phenomena.

An area of thymic dulness may occasionally be mapped out. This area is usually triangular in shape with unequal sides, the base being at the level of the sternoclavicular articulation, the blunt apex above and behind the level of the third rib. The lateral boundaries extend somewhat beyond the sternal lines, usually more to the left, but in the case reported it extended to the right. As a rule there is very little dulness to the right. If the dulness extends more than one centimeter beyond the sternal line it usually denotes enlargement. Hochsinger has percussed an enlarged thymus in twenty-six children, and his diagnoses were subsequently corroborated by the Roentgen ray.

Auscultation may disclose stridor, otherwise it is negative.

The blood usually shows anemia and lymphocytosis.

Any condition which may precipitate an attack of thymic symptoms should be

avoided; for instance, throwing the head far backward, high position of the head, excitement, crying, screaming, running, jumping, very warm or very cold baths, swimming. Where operations are necessary, local and not general anesthetics should be employed.

The general hygienic conditions should be improved. A good, well-regulated diet, quiet life out-of-doors, and equable climate should be recommended. Acute infections of the upper respiratory tract should be treated without delay.

Many operations have been advised and tried. Complete removal of the thymus has always been followed by disastrous results, hence it is no longer recommended. König and many others advise against complete removal of the thymus. He recommends either stitching to the sternum or a resection.

Roentgen irradiation has been employed with favorable results in a number of cases. Flügge, Waters, Rudberg, Aubertin and Bordet, Sinorzersky, Myers, Lange have demonstrated that thymic asthma and marked atrophy of the gland followed roentgenization, together with improvement in the symptoms. Involution begins in from one or two hours after exposure and continues for a variable length of time according to the intensity of irradiation, regenerative changes gradually taking place after treatment has been discontinued.

Irradiation must be employed with caution, as it may inhibit further growth in the tissues (proved by experiments on young animals) and also produce intoxication from the products of lymphoid disintegration.

Thymus feeding has been tried, but without apparent effect upon the affected gland. It seems to have a general tonic action, however. Sabatini reviews some recent researches by Fiore and Franchetti, in which they have apparently demonstrated that it is possible to accelerate the involution of the thymus by injecting serum from adults of the same species. This has been confirmed by their experiments in laboratory animals.

In the absence of any other definite cause for cough in the case reported, the author felt justified in saying that enlargement of the right lobe of the thymus was the underlying factor.

Whether the cough is produced by mechanical pressure of the gland upon any part of the respiratory tract, or whether it is produced by irritation of the recurrent laryngeal or vagus nerves, is a very difficult matter to decide.

PERIPHERAL VASOMOTOR MANIFESTATIONS IN SHOCK.

MUNS (*Journal of the Missouri State Medical Association,* November, 1915) regards as inseparable from the subject of blood-pressure in shock the question of the condition of the peripheral and splanchnic arterial circulation. The three great factors in the maintenance and stabilizing of the blood-pressure are (1) the rate and volume of ventricular contraction, (2) the amount of fluid contained in the circulatory system, and (3) the peripheral resistance as represented by the arteries of the peripheral and splanchnic circulations. Concerning the condition in shock of this last factor, much has been said. Many statements have been made by various investigators as to the actual condition of the peripheral vessels after shock has been brought about by intestinal trauma, but, with few exceptions, such changes have not been clearly demonstrated. Some have apparently shown that the vessels in the periphery following long-continued intestinal trauma are dilated, while fully as many maintain that this is not true, but that the whole peripheral system of vessels is contracted.

The author's investigation has for its purpose the demonstration of the actual changes in condition of peripheral circulation following severe manipulations of, and trauma to, the intestines, and the bearing of such changes on the blood-pressure. It is not the purpose of this study to be concerned about the etiologic factors at work in the production of any of the signs or

changes that may be observed, but to record, graphically where possible, some of the actual conditions found after trauma to the intestines, and, if possible, to correlate and harmonize the findings with other proved phenomena. The question of what happens in beginning shock seems to present more opportunities of demonstration that the phenomenon prevailing in well-developed, long-continued shock, because of the danger of mechanical and operative complications in the latter.

It is proposed, therefore, to show: (1) that there are definite changes in the condition of the blood-vessels of the periphery closely following intestinal trauma, the term periphery to mean the whole of the legs, and the body musculature and skin; (2) that these changes can be shown to account for the high or low blood-pressure in cases of shock brought about as above stated.

The method of experimentation consisted in measuring the actual changes in the peripheral vessels. Trauma of the exposed intestines brings about a certain vasomotor response in the blood-vessels of the periphery, and this response is a reflex vasoconstriction. This change in the peripheral vessels begins almost immediately the intestines are disturbed and continues as long as the stimulation is applied.

The effect of intestinal trauma on blood-pressure is determined by the relative degree of constriction or dilatation which exists in the periphery at the inception of the procedure.

The work is summarized as follows:

In every experiment except two there was an immediate change in leg volume.

At the beginning of each experiment there was a period of unstableness of the vasomotor mechanism in the leg without much disturbance in blood-pressure.

These variations in most cases pass away in a few minutes.

In all cases but one there was a fall of leg volume of from 2 Cc. to 10 Cc.

In all cases but two the blood-pressure was maintained throughout the experiment, or at the end was higher than at the beginning.

DIAGNOSIS OF APPENDICITIS IN EARLY TYPHOID FEVER.

WINSLOW (*Annals of Surgery*, November, 1915) reports four cases. In three of them pain appeared to be the symptom which first attracted attention and not fever. There was a moderate leucocytosis in all. In none was the Widal reaction positive; it became so subsequently. In all the cases the appendix was somewhat congested, possibly thickened, but not acutely inflamed, while the large and small intestines were also more hyperemic than normal. The mesenteric and prevertebral chains of lymph nodes were also markedly enlarged in most of the cases.

The author believes that a mistaken diagnosis of appendicitis in early typhoid fever is by no means uncommon; and his purpose in presenting his communication was more for the purpose of eliciting information than for imparting it.

He said that he did not know how to avoid this mistake. He was aware that Dr. Murphy laid down the rule that in appendicitis pain always precedes fever, while in these atypical cases fever always precedes pain. He did not think we should accept this statement axiomatically. In many cases it will be impossible to ascertain whether pain or fever was the initial symptom; and in some cases of typhoid fever pain appears to have been the first symptom to attract the patient's attention. Indeed, Osler says enteric fever may be ushered in with pain in the abdomen, and that "on account of pain in the right iliac fossa, fever, and constipation, the diagnosis of appendicitis has been made, and in two such cases at Johns Hopkins Hospital laparotomy was performed." The author thinks it probable that some lesion of the appendix is present in these cases.

The leucocyte count is probably the most reliable diagnostic sign, and it is usually low in typhoid fever and markedly increased in appendicitis, though at times there may be a low leucocyte count in serious and even fatal appendicitis.

He thinks also there is less muscular rigidity and tenderness in these typhoid

cases than in cases of genuine appendicitis. Headache also is more common. Another possible factor in the diagnosis may be the time of the year at which the cases occur, as three of the four cases here reported occurred in July and August, months in which typhoid is especially prevalent.

In conclusion the writer thought it a very unfortunate occurrence to mistake a case of beginning typhoid fever, with abdominal pain, for appendicitis and to subject such a patient to an abdominal section. This can only be avoided by a careful consideration of the history of the onset of the malady, to ascertain whether fever or pain was the initial symptom; whether the pain was sudden and severe or developed after prodromal symptoms of headache, malaise, and fever. If the abdomen is not markedly rigid, even though pain and tenderness in the right iliac fossa be present, and if the leucocyte count remains low, operation should be deferred until a clear diagnosis is reached.

ANALYSIS OF CASES OF TETANUS TREATED IN HOME MILITARY HOSPITALS.

The *British Medical Journal* of October 23, 1915, analyzes 231 cases of tetanus treated in the home hospitals, of which number 98 recovered and 133 died, giving a mortality of 57.7 per cent, and notes that from over seas it is reported that 179 cases of tetanus have been treated, of which 140 died, a mortality of 78.2 per cent. The death-rate of unoperated cases is stated to be 91 per cent in those of short incubation, fifty per cent in those of delayed incubation. At Netley the mortality stands at 81 per cent, probably due to the fact that the serious cases and those already showing symptoms would naturally be sent there. There were six cases at Aldershot and six recoveries.

In five of these cases a prophylactic dose of serum was given immediately on admission to hospital at Aldershot, and in the curative treatment the direct injection into the spinal canal was always used. In England resort to this preventive use of serum appears to have been rare, and it is suggested that in suspicious cases it seems a sound line of treatment. After onset of symptoms the intrathecal way of approach appears also to be far the most effective.

At Aberdeen there were three cases with three recoveries. None of these had a preventive dose on admission to the Aberdeen Hospital. One had 147,000 units (140,000 subcutaneously, 4000 intravenously, and 3000 intrathecally), another 18,000 units (16,500 subcutaneously and 1500 intrathecally), while the third had only 3000 subcutaneously.

Colchester also had good results—seven cases with five recoveries. Here also there was no prophylactic treatment on admission, and nothing noteworthy in the manner of curative treatment. Most of the cases occurred during September, October, and November, 1914. This may have been due to the fact that the wounded were more exposed to contamination of their wounds at that time, which included the retreat from Mons; that there was less opportunity of receiving surgical treatment as rapidly and as effectually as later on; that during this time the preventive use of antitetanic serum had not been developed, as it has during the last six months, when it is reported that, wherever possible, every wounded man has received a prophylactic dose; and generally that experience has taught medical officers how better to cope with the conditions obtaining in time of war, to unlearn the lessons of modern aseptic surgery, and to revert to the older methods of free incisions, thorough drainage, and constant removal of septic products by baths or irrigation.

At the present time it is impossible to say which of these factors has been the most important. In the cases dealt with, if the symptoms of tetanus appeared within ten days of receiving wound, the mortality was 66.6 per cent; if between the eleventh and twenty-fifth, 39 per cent.

Among the 231 cases, only 37 are noted as having been treated with antitetanic serum before the onset of symptoms: 20 in France, 7 in England, 10 not specified. Of

these 37, 18 recovered and 19 died, giving a mortality of 51.3 per cent.

The usual dose was 1500 units (8 records), but 1000 were given in some cases, 3500 in two, and 4000 in two.

Out of the total of 231 cases the numbers treated with antitetanic serum after the onset of symptoms was 215 (93 per cent). Sixteen cases did not receive curative treatment with antitetanic serum in England. Of these, three recovered and 13 died; mortality, 81.25 per cent. Of the three which recovered, all had been treated prophylactically in France. Of the 13 which died, six had been treated prophylactically in France.

It is generally held at the present time that success in the treatment of tetanus by antitetanic serum depends on the use of big doses.

Out of the 231 cases under review, in 200 only was the amount of serum recorded. In analyzing these 200 cases it must be noted that the amount of serum given is the total amount, not the daily amount or the amount of each dose. For example, if a serious case came into hospital, received 10,000 units, and died at the end of one day's treatment, this would be put down as 10,000, whereas a milder or more chronic case receiving the same treatment for ten days would be returned as having had 100,000 units. It would be false to argue that as the one got ten times as much serum as the other and recovered, the result was due to the larger amount of serum given.

The main conclusion to be drawn from a study of these cases of tetanus treated therapeutically by antitetanic serum is that it seems highly probable that the serum has little or no effect on the course of the disease. There is a little evidence that, if the serum has any effect at all, then the intrathecal method of injection is the most effective. It hence arises that, if serum is to be used at all, then it should first and foremost be injected intrathecally in as large dose as possible, and repeated as often as safe and practicable, as long as symptoms persist. If there is any likelihood that tetanus toxin is still being absorbed into the blood stream from the wound, then, in addition to the intrathecal injection, a further quantity of serum may be introduced intravenously and subcutaneously. In this way 3000 to 5000 units could be injected into the spinal canal and 10,000 to 20,000 into a vein and under the skin.

On account, doubtless, of the ease of giving serum by subcutaneous injection, this method is most used. In 116 cases out of the 215 under consideration (54 per cent) it was the only method employed. In 190 cases (88 per cent) it was one of the methods used. The intrathecal method was only used in 73 cases out of the 215 (33 per cent).

Now the contention is that the intrathecal path should be used in every case in which serum is used, either alone or in conjunction with the other methods.

The treatment of tetanus by carbolic acid injections was described by Baccelli in 1888, and consists of the subcutaneous or intramuscular injection of carbolic acid. It is generally used in a 1-in-20 solution, and from 3 to 12 grains of the acid constitute a daily dose.

In the present series 33 cases were treated by this drug; 12 patients recovered and 21 died (63.6 per cent).

From a study of the table it would appear that there is no evidence that carbolic acid has any favorable therapeutic effect on cases of tetanus. It is also suggested that small doses, such as half a grain a day, are quite inadequate.

The injection of a solution of magnesium sulphate seems to have been first used in America, and its value depends on its powerful sedative or anesthetic action on the spinal cord. Few of the cases under observation in England have received this treatment. One case was given 2 Cc. of a 25-per-cent solution intrathecally; another, one injection (amount and strength not given) subcutaneously; another received 2 Cc. of a 25-per-cent solution with each dose of serum intrathecally. Three doses were given, and the patient recovered. Two cases received intrathecal injections, one of them 7 Cc. of a 25-per-cent solution. In other

cases it was given by the mouth and by the rectum, but in these it could not have been intended to exert its action on the spinal cord. Nine cases in all were treated with magnesium sulphate; of these seven died and two recovered.

It would appear that this method of treatment is powerful and not without danger, so that great caution ought to be used in its exhibition. Stromeyer treated five cases, giving an injection of 8 Cc. of a 15-per-cent solution. In two of these there was marked anesthesia of the trunk and lower extremities; in the other three no anesthesia was noted. In all five cases after the injection there was a cessation of the spasms and muscular rigidity, the patient slept, and respiration was slowed.

In the 231 cases of tetanus under review the mortality was 57.7 per cent.

Cases with a short incubation were more fatal than those of longer incubation.

Most cases occurred on the tenth day after the wound.

There are few allusions to the use of antitetanic serum as a prophylactic.

In regard to the therapeutic effect of antitetanic serum, the evidence would go to show that this action is not well marked.

If antitetanic serum is used—and in such a fatal disease it would seem wrong not to give the patient the benefit, even if doubtful, of the antitoxin—it ought to be injected in the first place intrathecally, as this method would seem to possess advantages over the intravenous and subcutaneous methods.

There is no evidence that any benefit accrued to the cases treated by carbolic acid or magnesium sulphate injections.

To sum up, the treatment of a case of tetanus might be as follows:

Place in a quiet, darkened room under care of a sympathetic and capable nurse.

The best surgical treatment of the wound should be thoroughly carried out to insure the prompt and complete removal of all septic products.

The intrathecal injection of at least 3000 units of antitetanic serum. At the same time 10,000 to 20,000 units may be injected intravenously and subcutaneously. This procedure to be repeated as frequently as the course of the disease seems to demand.

In addition to this the patient should receive sedative drugs, such as chloral or chloretone, in full doses.

A NEW OPERATION FOR THE RELIEF OF PRURITUS ANI.

Back (*Practitioner,* November, 1915) describes a modification of Sir Charles Ball's method; the latter consists of making two crescentic incisions round the anus enclosing the entire ellipse, with the exception of a narrow neck in front and behind. The flaps of skin so marked out are raised, and carefully dissected up as far as the mucocutaneous junction. The flaps are replaced and retained by sutures. The whole idea of the operation is to cut the superficial sensory nerves supplying the part, and so to render the area anesthetic.

Now it can be demonstrated beyond contradiction that the superficial nerves are cut. If, therefore, the hypothesis that the pruritus is due to an abnormal condition of these superficial nerves is correct, the percentage of cures should be higher.

Back therefore began to make a systematic examination of the cases after this operation by testing the sensibility of the area inside the incisions (1) to a light touch with cotton-wool (epicrisic), and (2) to a pin-prick (protopathic). The results were so anomalous that he began to doubt the correctness of the superficial nerve theory.

Of the first 20 cases he thus examined, 12 were cured. None of the dozen, tested two months after the operation, had any perceptible diminution of perianal sensation, protopathic or epicrisic. Of the remaining eight, who were unrelieved, two after the same interval of time had complete perianal anesthesia. Back noticed one other curious thing. In spite of the greatest care taken in tying vessels during the performance of Sir Charles Ball's operation, a hematoma, of greater or less degree, does fairly often supervene. In all the 12 cases of cure, some degree of hematoma had been observed, but in only two of the eight unsuccessful cases.

Now the anal region is supplied with blood by the inferior hemorrhoidal artery, and the tone of this artery—*i.e.*, its condition of constriction or dilatation—is controlled by the small branches from the sympathetic system which travel with it. It occurred to Back that if he wilfully cut and ligatured the artery, he should, at the same time, divide the nerve which controlled it, and thus relieve the vasomotor incoördination of the part.

He, therefore, makes the same incision on each side of the anus, as in Sir Charles Ball's operation, but instead of dissecting up a flap he cuts frankly down into the tissue of the ischiorectal fossa, until he meets and divides the inferior hemorrhoidal artery. The artery is small and cannot be dissected out, but it is easy to cut across it, and its spouting ends are then readily recognized and ligatured.

GUNSHOT WOUNDS OF THE HEAD.

Several papers in the *British Medical Journal* of October 2, 1915, suggest editorial comments as follows:

Dr. Gordon Holmes and Mr. Percy Sargent draw attention to a new type of vascular lesion in the brain, a type brought into prominence by the large number of glancing or shallowly penetrating wounds about the vertex of the skull that have to be dealt with. These injuries result in thrombosis of the superior longitudinal sinus and of its associated lateral venous lacunæ and the superior cerebral veins connected with them; in addition, there may be gross injuries of the adjoining cerebral tissue.

Naturally the symptoms and signs vary much with the location and severity of the injury received. Their outstanding features, however, consist in the unusual distribution and type of the palsy induced, in the muscular rigidity always associated with it, in the curious disturbances of sensation observed, and in the relatively slight extent to which the sphincters are involved. As regards the paralyses noted, it was found that out of 78 patients 20 had all four limbs involved, 31 had both legs and one arm affected, 16 had only the legs paralyzed; in 6 the signs were mainly hemiplegic; and in 5 one leg alone was touched. The hands were less severely affected than the arms, while the feet were more paralyzed than the legs—a most unusual feature when comparison is made with the cerebral palsies commonly met with in civil practice. As the authors point out, this curious distribution finds its natural explanation in the anatomical disposal of the motor centers for these distant parts of the body in the cortex of the brain. The muscular rigidity of the paretic limbs is described as very striking; it occurs early, is generally coextensive with the paralysis, and usually diminishes in proportion as the power of spontaneous movement returns. Even the muscles of the trunk may be involved, so that the abdomen is rigid and the respiratory movements become feeble. In certain instances reflex spasms have been associated with the rigidity, and in ten patients fits were observed, unilateral in eight instances; the reflexes are increased, and Babinski's sign is present. The sensory changes found are said to be those of pure cortical lesions unaccompanied by any shock effect, as, indeed, is the case with the motor symptoms.

The clinical picture is so novel that the authors hasten to christen it with the title of the "Longitudinal sinus syndrome." It is satisfactory to learn that most of their patients recovered. It is too early yet to give figures that can be regarded as final; only one patient died out of thirty-seven that were not operated upon, while out of thirty-nine on whom operative procedures were taken fifteen died, seven of the fifteen having also some direct injury of the brain.

The authors remark on the difficulty of deciding upon the line of treatment that should be adopted in these cases of injury to the superior longitudinal sinus; they characterize the results of surgical interference as extremely unsatisfactory, and emphasize the tendency of cases uncomplicated by laceration of the brain to improve spontaneously. Yet in many cases operation is indicated for fear of septic infection and other complications, as is set out by Captain

Roberts, who gives figures proving the remarkable success attending the treatment of soiled and septic scalp wounds on the lines indicated by common sense and the requirements of aseptic surgery. Captain Roberts urges once more, as so many have done before him, that gunshot wounds of the scalp should not be probed. The probe is a deadly weapon here, as it may readily convey a superficial infection into the depths of the wound. He recommends excision of the scalp wound, and of the injured bone beneath it if need be; if the dura mater is uninjured the operation wound is sutured and closed without drainage. He reports that out of 118 cases in which this primary suture without drainage was practiced, 114 healed by primary union, and only one broke down altogether. Like Captain Tabuteau, he recommends that all foreign bodies within reach of the exploring finger should be removed from the brain when that has been penetrated.

Captain Tabuteau, on the strength of an experience based upon 95 cases, puts forward a plea for the most thorough surgical examination of every case of gunshot wound of the head, no matter how trivial the injury may be at first sight. The wound should be excised, and the underlying tissues submitted to the most careful scrutiny. A comparatively small wound in the scalp may overlie extensive fractures of the skull and severe lacerations of the brain, a condition of affairs that calls for immediate and thorough surgical investigation. In other instances the contrary is the case, and an apparently severe scalp wound may be associated with no intracranial damage whatever. When it is found that the dura mater has been torn, a digital exploration of the lesion or track in the substance of the brain should be made. Naturally, much help may be gained here by use of the *x*-rays, when penetrating fragments of metal or bone will be brought into view. Like Captain Roberts, he recommends the administration of urotropin (1 or 2 drachms a day) to patients in whom a fracture of the skull is even suspected. It would be interesting to know how far such internal medication is actually capable of preventing or cutting short intracranial sepsis. The amount of the drug or of its products of decomposition that reaches the cerebrospinal fluid must be almost infinitesimal.

CONCLUSIONS REGARDING THE LIMITATIONS OF LOCAL ANESTHETICS IN ANORECTAL SURGERY.

GANT (*West Virginia Medical Journal*, October, 1915) observes that when operating upon rectal, urinary, and other affections at the pelvic outlet it is necessary to choose between regional and local anesthesia. In the former the anesthetizing fluid is deposited in the cord or an individual nerve, with the object of desensitizing the parts supplied by the nerve and its branches, while in the latter the lesion operated upon is infiltrated and anesthetized by injecting the solution directly into it without attempting to reach any particular nerve. The author states that he wastes no time in searching for nerves, because he knows that when enough water or eucaine is deposited to cause blanching of the tissues he can operate without discomfort or pain. The desensitizing action of the anesthetic in local and regional anesthesia is due to nerve blocking produced by pressure of the fluid upon the nerves or chemical action of the solution upon the nerve equipment, or both.

In so far as operations about the rectum and anus are concerned, the ether spray, ethyl chloride, liquid air, and agents which deaden pain by benumbing or freezing the parts are of little use because they are not always effective, induce severe initial and postoperative pain, are unsuitable for extensive operations, and are often followed by extensive sloughing.

Cataphoresis, as suggested by Wagner (1886) and perfected by Morton (1891), is not a desirable means of producing anesthesia because it is unreliable, requires considerable preparation, an extensive electrical equipment, and a much longer time to anesthetize the parts than the infiltration method.

Solutions of eucaine, cocaine, stovaine,

novocaine, etc., alone or in combination, have been employed more or less frequently for producing local and regional anesthesia, and their popularity has been largely due to the writings and teachings of Corning, Schleich, Oberst, Reclus, Demont, the writer, and others.

After experimenting extensively during a number of years with the above-mentioned chemicals, sterile water, quinine and urea hydrochlorate (½-per-cent solution), he has come to the conclusion that the most reliable agents to employ in operations about the anus and rectum are a ⅛-per-cent eucaine solution and sterile water or a normal salt solution. Formerly the author employed eucaine, cocaine, novocaine, stovaine, etc., much stronger than now, but increased experience has demonstrated that any operation suitable for local anesthesia can be painlessly performed with ⅛-per-cent eucaine solution.

The author's experience with eucaine anesthesia has been universally satisfactory in over 4000 operations, and he prefers it because it can be sterilized, does not irritate, and has invariably produced complete anesthesia and caused less toxic manifestations than cocaine, stovaine, novocaine, and like agents used in equal strength and quantity. In fact, when eucaine is employed in a ⅛-per-cent solution in anorectal operations, the patient rarely complains of pain, dizziness, turns pale, becomes excited, or faints during or following operations owing to the non-toxic action of the drug, slight amount of eucaine required, and escape of the solution during and immediately following the operation.

While experimenting with drugs he observed that they invariably produced complete anesthesia of the infiltrated part when retained, and that when the solution escaped through a fissure, ulcer, or fistulous opening the anesthesia was incomplete. This fact suggested the idea that all or part of the desensitizing action of the water or solution was due to its pressure exerted upon the local nerves or their terminals. To determine if this was so experiments were begun in September, 1901, with sterile water, normal saline solution, compressed air, oil, and other media which could be injected into and made to distend the tissues. The results, in nearly every instance, showed that the injection of sterile water or a normal salt solution would produce complete anesthesia and enabled him to perform operations about the anorectal region which were heretofore performed under general narcosis. These experiments further demonstrated that neither the temperature of the water nor chemical employed were entirely responsible for the desensitizing action of the injected fluid. He was able to perform many successful operations with water or the solutions at varying temperatures, but observed that less discomfort followed when the agent was introduced at the bodily temperature. It was also observed that when enough fluid had been deposited in the tissues to cause them to become glassy white, anesthesia was complete, and that when the operation was begun before such blanching was obtained, cutting caused sharp pain, irrespective of the temperature or composition of the fluid injected.

He has painlessly operated for the relief of internal, protruding and bleeding hemorrhoids, external, cutaneous and thrombotic hemorrhoids, uncomplicated complete, blind internal and external fistulæ, foreign bodies, simple prolapsus ani, fissures, anal papillæ, cryptitis, ulcers, polypi near the anus, incision of ischiorectal, submucous, marginal and follicular abscesses, hypertrophied rectal valves, stricture within the anal canal, some congenital malformations of the anus and rectum, sacral dermoids, cysts, condylomata and lipomata of the lower rectum and buttocks, incipient and developed epitheliomata, perianal cysts, foreign bodies located beneath the skin or mucosa, division or divulsion of sphincter for constipation, fecal impaction or sphincteralgia. He has also performed colostomy, appendicostomy, colopexy, cecostomy, and celiotomy under local anesthesia to relieve intestinal obstruction, constipation, chronic invagination for exploratory purposes, and to improve the condition of patients suffering from rectal

procidentia and the various types of ulcerative colitis causing chronic diarrhea.

Grant regards as not suitable for local anesthesia all rectal malignant and benign growths, extensive procidentia recti (involving all bowel coats), pelvic and large perirectal and ischiorectal abscesses, deep, boring fistulæ and polypi when large, numerous, and high up.

The administration of a general anesthetic is also imperative for most surgical operations performed for the relief of lesions situated in the upper rectum and for extirpation and resection of the bowel, incision of the coccyx, removal of tumors, operations upon strictures located above the peritoneal attachment, necrosis of the coccyx or sacrum, congenital malformation of the rectum above the internal sphincter, and other affections of the anorectal region, necessitating an extensive or an unknown amount of cutting.

General anesthesia is also indicated in operations for abscess, fistula, fissure, hemorrhoids or other anorectal disease which interferes with the anesthetizing process, exposure of the lesion, or prevents a thorough operation.

Again, infiltration anesthesia is not effective when the areolar tissue is loose and permits the water or eucainized solution to disseminate before it has had an opportunity to sufficiently compress or otherwise act upon the nerves to produce a satisfactory anesthesia, and where the secretion leaks through an ulcer, fissure, or fistulous opening before desensitization of the part is obtained.

Gant observes that much unnecessary postoperative pain follows the employment of large rubber tubes wrapped with gauze, supposedly introduced for the purpose of allowing flatus to escape, while in reality they are pressure plugs, used because the operator fears postoperative hemorrhage. After a large personal experience with the rectal tube he wishes to say that it is unnecessary, causes great pain while in place, and hurts terribly when removed later after the granulations have become enmeshed in the gauze. Hence he never employs a tube, gauze plug or pledget in fissure, hemorrhoidal, or other rectal operations, except for drainage purposes or to temporarily arrest or prevent bleeding.

In conclusion he states that his experience with sterile water and eucaine anesthesia in coloproctology during the past fifteen years has been extensive and so very gratifying that he does not hesitate to recommend infiltration anesthesia in preference to general narcosis in the majority of minor and many of the more extensive operations which the modern proctologist is called upon to perform.

WOUND INFECTIONS AND THEIR TREATMENT.

WRIGHT (*Lancet*, Nov. 6, 1915), as the result of his experimental and clinical studies, states that he can put what he has to say in a very few words. He has not himself come across—and he has permission of all his fellow-workers to say that they also have not come across—any satisfactory clinical or bacteriological evidence of the utility of antiseptics as employed in infected wounds. In connection with this, he states that working as they have been for the last year in the largest base hospital in Boulogne, they must have watched and examined bacteriologically very many thousands of wounds—to say nothing of their having conducted the bacteriological examinations in no less than four long series of clinical experiments undertaken to put to the test the confident prognostications of reputable promoters of this or that antiseptic. The opinion he has just expressed—*i.e.*, the opinion that, judged by its clinical results, the antiseptic treatment of infected wounds is of quite doubtful utility—is that which is held by the very large majority of those who have had prolonged practical experience in this war.

Contrary opinions have been expressed; these should be very largely discounted. For the most part they are opinions expressed by persons possessing a very limited experience and unfamiliar with the course the wound follows when left to itself.

Credit may have been given to the antiseptic, where it ought really to have been given either to the menstruum in which it was applied or to incidental circumstances attendant upon the treatment. Thus, for instance, continuous irrigation practiced with antiseptic solutions would effectively wash out the wound and keep it constantly moist; a hypertonic menstruum used as an excipient for the antiseptic would act as a lymphagogue; peroxide of hydrogen would effectively assist in the evacuation of the pus; carbolic acid or other antiseptic used in the form of hot fomentations would bring heat and moisture to bear; and no doubt many different varieties of antiseptic would induce temporary hyperemia. He thought it would be seen that favorable results occasionally manifesting themselves after antiseptic treatment might quite well be interpreted in the sense here suggested.

So far has been considered in connection with the clinical data only the question whether the antiseptic has had any beneficent effect in the wound. Let us now turn the leaf, and see whether there are entries also on the debit side; and let us here consider the effects produced in the wound itself, dealing afterward with those produced on the healthy skin in its neighborhood. In connection with this he first emphasizes the fact that disastrous results —he was thinking more particularly of the development of gaseous gangrene—supervene when antiseptics made up in viscid or semisolid excipients are introduced into the wound. For this result the excipient which confines the discharges and imprisons the infection would seem to be primarily responsible.

It is, however, not only antiseptics in unsuitable menstrua which arrest the outflow of lymph and imprison the infection. With perhaps the exception of carbolic acid employed in concentrated form, all antiseptics in their degree, and strong antiseptics in particular, would seem, by coagulating the albuminous substances on the surface of the wound, to exert this prejudicial effect.

Coming now to the application of antiseptics to the skin surface in the neighborhood of the wound, we have, of course, here a procedure which has exactly the same aims as the preparation of the skin for operation, except only that it is here foreseen that the wound will remain open.

The usual procedure for the sterilization of the skin in field ambulances is to paint strong iodine all round the wound, and then—plant for sterilizing dressings not being available so far to the front—to cover in the wound with cyanide gauze. This in many cases is followed by results like those which used to be obtained when carbolic fomentations were used as a prelude in surgical operations. There is produced—and this applies quite generally in connection with every application which "irritates the skin"—first, reddening of the epidermis; then effusion and blistering; and then there develops in the blisters a luxuriant growth of serophytic microbes. In other words, by our misdirected energy we cultivate at the very doors of our wound, upon the very area of skin which we intended to keep from microbes, a copious harvest of streptococci and staphylococci.

One word about a kind of antiseptic which concentrates its chemical energy upon the microbe, instead of, like the ordinary antiseptic, expending it wastefully upon the albuminous substances in which the microbe may be embedded. Those who have followed the development of "chemotherapy" will immediately perceive that the author refers to salvarsan and ethylhydrocuprein hydrochlorate (now known as optochin), and will appreciate that, if these chemical agents can be shown to exert a powerful bactericidal effect upon pyogenic organism, they might perhaps usefully be applied both directly in the wound and also by the channel of the blood, reaching in these ways all the microbes in the body with the exception only of those embedded in dead spaces and infiltrated tissues. Captain S. R. Douglas and Lieutenant A. C. Inman, working the one with salvarsan and neosalvarsan, and the other with optochin, have found that these kill the streptococcus in serum, and that optochin in particular kills

the streptococcus in serum in very high dilutions.

A long series of surgical procedures all having reference to the treatment of wound infections might quite properly come up for consideration here if this were a treatise instead of an introductory lecture. The author runs over the list, indicating in connection with each the place that it would take in the treatment of the wound infections. We have, first, the opening up of the wound, and the incision of the tissues undertaken to get drainage for imprisoned infections; secondly, the washing out of the wound and the irrigation of the walls with therapeutic fluids; thirdly, the immobilization of the limb for the avoidance of auto-inoculations; fourthly, the ablation of the heavily infected and infiltrated walls and floor of the wound; and fifthly, the secondary suturing of the wound for restricting the area of exposed and infected surface, and closing the wound when the infection has been overcome.

The customary procedure in connection with wounds is to remove only those portions which are sloughing; and to amputate, where a limb is involved, only that portion which is deprived of its blood-supply, or quite hopelessly infected. To Colonel H. M. W. Gray is due the credit of pointing out, and enforcing by a long series of cases successfully treated under his supervision in the military hospitals at Rouen, that it is possible in suitable cases to abort wound infections by the excision of the infiltrated wall and floor, the operation being completed by sewing up the wound immediately, or after treatment with hypertonic salt solution. The kind of cases which Colonel Gray selected for treatment by excision are scalp wounds and what we might call "gouged out" and "punched in" wounds of soft tissues.

The theoretical considerations which commend the procedure of Colonel Gray are that it removes heavily infected portions of tissue which, though they could be brought back to a healthy condition, are for the moment incapable of contending successfully with infection. And, above all, the method holds out a prospect of immediate victory over the infection; and, of course, practically immediate convalescence.

That a deep wound when once infected must be allowed to granulate up from the bottom, and that a surface wound must be allowed to close by the growing in of skin from the sides, are maxims which would be in their proper place in a system of surgery which aimed at doing all it could to delay healing and keep the patient in hospital for the longest possible time.

On the other hand, it might quite well be imprudent to embark deliberately upon a policy of sewing up microbes in wounds to accelerate healing.

Let us place before ourselves first these facts. An infection of subcutaneous tissues is always of more serious import than a mere surface infection. There will always be something unfavorable either in the general condition or in the histological conditions when microbes succeed in maintaining themselves in the tissues. Here at least the leucocytes and the blood fluids ought to be able to hold their own. Exactly the contrary holds true of surface infections. On denuded surfaces, no matter how healthy the condition, the microbes, though they may sometimes have to struggle, will always find means to maintain themselves. As long as the floor and walls of the wound are still indurated we can be sure that we are still dealing with an imprisoned infection. On the other hand, when we have lying naked before us in the wound a system of lymph spaces communicating freely with one another, filled in with clear fluid, and fed from full capillaries, we then know that we have got rid of the imprisoned infection, and that if any infection still lingers it is a purely surface infection.

Wright asks whether the antiseptics ordinarily used may not be serviceable because of the stimulating effect rather than because of any antibactericidal influence, and suggests the word phylacagogic agents or such applications as bring the protective elements of the body—*i.e.*, the blood fluids and leucocytes—into application with the wound. In this present contribution he confines him-

self to the study of strong and weak salt solutions. We have in these phylacagogic agents—in hypertonic saline solution a lymphagogic and in physiological saline solution a leucocytagogic agent.

Hypertonic salt solutions exert three kinds of effects: a physical effect, a physiological effect, and an effect on the condition of the wound and the bacterial infection.

REVIEWS.

OBSTETRICS. A Practical Text-book for Students and Practitioners. By Edwin Bradford Cragin, A.B., A.M., M.D., Assisted by George H. Ryder, A.B., M.D. Illustrated. Lea & Febiger, Philadelphia, 1916.

This is a book of nearly nine hundred pages, illustrated with 499 engravings and 13 plates, and has been prepared by a teacher and practitioner of obstetrics who is widely and favorably known amongst medical men in this country and abroad for the sane views which he holds in regard to this important department of medical practice. The book is not quite as large as some of the other modern text-books on obstetrics, and is correspondingly advantageous since it is not necessary to read a great volume of text to obtain the practical points which are immediately desired. On the other hand, he who studies the volume will find that it is sufficiently complete to give him all the knowledge which he should possess as a scientific and practical obstetrician.

The book is divided into six parts. The first part deals with the Anatomy of the Female Genital Organs and Embryology; the second part with Physiological Pregnancy and its Management—in this division there are nine chapters; part three considers Pathological Pregnancy; part four, Pathological Labor; part five, Obstetrical Surgery; and part six, the Pathological Puerperium.

It will be seen at once that this is a most satisfactory clinical division of the text, since the reader who seeks definite information along any particular line which is of intense interest at the moment can readily find from the table of contents in the index the facts which he desires.

In the treatment of the toxemia of pregnancy, which is a condition of interest to the general practitioner, who does little actual obstetrics but who is liable to be called upon to take care of such a case until an obstetrician can be obtained, we are interested to find that the author holds to the view that the condition should be looked upon as a toxemia associated with faulty proteid metabolism with a tendency to pathological lesions in the liver and kidneys, especially in the former.

Concerning the diet, if any food can be retained by the stomach, he states that meat should be avoided. Milk, either plain or diluted, or special preparations of milk and cereals, may be administered. If it be true that proteid metabolism is faulty we question whether the free use of milk is wise, but the generous employment of cereals is undoubtedly so. We think that the author is in error, however, in stating that the patient's nutrition must be maintained if possible by the employment of nutritive enemata, as, for example, peptonized milk. All recent researches show pretty clearly that little or no support, from a nutritional standpoint, is obtained by this means. Probably it would be wiser to use levulose, which seems to be absorbed as proteids are not. If the author's views concerning the use of sodium bicarbonate, to correct acidosis, are correct, then the free use of carbohydrates by the mouth or of levulose by the rectum is not only dietetic but medicinal in effect.

Of all the remedial measures known to the author, he states that that which has served him best has been colon irrigation with soda solution, once or twice daily, thereby emptying the bowel and furnishing food and alkalies to the system. We are sorry that he does not give definite directions as to the strength of the soda solution.

If it is above nine-tenths of one per cent it will cause the passage of fluid from the tissues into the bowel, but little or no soda will be absorbed. In the operation of emptying the uterus he strongly recommends ether instead of chloroform, since the latter drug is known to exercise a destructive influence upon the liver cells.

Another piece of excellent advice is that it is not sufficient for the pregnant woman to send specimens of her urine to the obstetrician every two weeks. She should be seen by him personally in order that her blood-pressure may be taken and that she may be examined for the presence of edema, headaches, disturbance of vision and digestion.

Dr. Cragin does not believe that chloroform is useful to control convulsions, but is harmful for reasons already given. It is interesting in this connection to note that he only had 71 cases of eclampsia in 8000 deliveries, which, being treated without chloroform, gave a mortality of eight deaths (11.2 per cent), whereas in 251 cases of eclampsia in 20,000 deliveries prior to the abandonment of chloroform there were 71 deaths, a mortality of 28 per cent.

Concerning chloral hydrate, the author thinks that we may feel justified in continuing its use in eclampsia, because in reasonable doses it is not likely to do harm to either the liver or the kidneys.

Dr. Cragin's work is essentially that of a practical clinician, and for this reason is certain to prove popular and useful.

PRINCIPLES AND PRACTICE OF MEDICINE. By Arthur R. Edwards, A.M., M.D. Third Edition, Thoroughly Revised and Rewritten. Illustrated. Lea & Febiger, 1916.

This exhaustive text-book of over a thousand pages, including its index, is a well-planned attempt to cover an enormous subject within the space of one volume, and, being prepared by one who is constantly engaged in teaching this department of medicine in a large medical school, it represents the needs of the student and the practitioner.

We are somewhat surprised to find that the author states that the pulse-rate of pneumonia is 100 to 120. Usually, we believe, the latter rate is a sign of very grave danger, and in ordinary cases a pulse-rate of 90 to 100 certainly is much more common. When this comparatively slow rate is compared to respiratory rate it gives us a diagnostic point in examining a patient who is thought to be suffering from this disease. We are glad to see that the author emphasizes the need of fresh air in its treatment, and that he insists upon the patient remaining absolutely quiet and not attempting to sit up.

We note with interest that he considers strychnine is the best vasomotor tonic, but we differ from him absolutely in his statement that this drug should be given in every case lest vasomotor paralysis and collapse develop without warning. We believe strychnine should be kept in reserve to meet these complications when they arise, and that to use it constantly destroys its efficiency when it is badly needed. So, too, we think the dogmatic statement that strophanthin should not be used if digitalis has been administered as it may cause sudden death does not really represent the facts as they exist, although it may have a modicum of truth in it. Nor do we think that the statement that heart stimulants must always be used with venesection is entirely correct. Finally, the dogmatic statement that the iodides are indicated in delayed resolution seems to us to require evidence in its support or some degree of modification.

It is very easy in reviewing a book of this kind to become a carping critic and still more easy to find fault with therapeutic recommendations which the author may, from time to time, see fit to make. The reader of such a review ought always to bear in mind that an author who gives his personal views is giving what the reader really wants, and not merely a summarization of what is generally given in other books. Dr. Edwards's work has a distinctly personal atmosphere. He states what he thinks and what he believes to be true as the result of his experience.

The illustrations are some of them rather

antique, as, for example, figures 30 and 31, and also 33, 34, 35. On the other hand, those illustrations which are more modern are well executed and reliable.

The volume will prove a useful guide not only to Dr. Edwards's own students, but to many practitioners, who will find in it a large amount of valuable information which represents a thorough knowledge of the subject derived from medical literature and personal experience.

THE TREATMENT OF ACUTE INFECTIOUS DISEASES. By Frank Sherman Meara, M.D., Ph.D. The Macmillan Company, New York, 1916.

This book is exactly what its title indicates, being a consideration of the therapy, medicinal and otherwise, of the various infectious diseases which affect man. Altogether the list of diseases numbers thirty-five. There is a preliminary chapter upon Febrile Conditions in General and another upon Diet in Acute Infectious Diseases, and after these the various maladies of an infectious nature are considered, being taken up chiefly in their order of importance, beginning with Acute Rheumatic Fever and ending with Septicemia and Erysipelas.

As Dr. Meara has been actively engaged in teaching therapeutics in the Cornell Medical School for some years, and as he is one of the attending physicians at the Bellevue Hospital, he has had sufficient experience to make whatever he states along these lines of interest and importance.

We are glad to note that he is in favor of feeding fevers, rather than starving them, particularly in the case of typhoid fever. In the treatment of acute rheumatic fever he insists upon the necessity of administering large doses of the salicylates, and he very properly emphasizes the need of giving bicarbonate of soda with the salicylates. He also seems to consider that sodium salicylate is the most efficient preparation. Aspirin is also referred to in terms of approval. His advice that the severe pain of acute articular rheumatism had better be controlled with morphine rather than large doses of the coal-tar products is also wise.

It has been our experience that lanolin is a better ointment base with ichthyol for the inflamed joints than petrolatum, as the latter tends to prevent the absorption of any drug. These statements in regard to advice which the author gives in the treatment of rheumatism are indicative of the methods which he follows throughout the rest of the volume.

The use of the personal pronoun is constantly resorted to, and this gives the book an individuality which many volumes lack. So, too, at the close of each chapter there is given a brief summary of the treatment of the disease and for the treatment of its complications, which, after all, is another form of a therapeutic index. Little or no attempt is made to quote other writers. The text is an expression of the author's individual views. They are sane and safe and worthy of confidence.

PELLAGRA. A Modern Problem. By George M. Niles, M.D. Second Edition, Illustrated. W. B. Saunders Company, Philadelphia, 1915. Price $3.00.

In the three and a half years which have elapsed since the publication of the first edition, this book has shown itself to be sufficiently important and interesting to have exhausted the original copies and a reprinting. In the present edition many changes and additions have been made in an endeavor to bring the text up to our present state of knowledge. The investigations of Goldberger and of the Thompson-McFadden Pellagra Commission are given careful consideration, and, in the chapters on treatment, the most recent views are discussed, from the use of scarlet red ointment for obstinate dermatitis to the consideration of emetine for amebic infections of the mouth and intestines.

The author admits that the causation of pellagra is not as yet definitely settled. The volume contains ten chapters, a bibliographical index, and an ordinary index. It is printed with such wide leading and such good-sized type that it is unnecessarily bulky, but also, for this reason, easy to read. A number of illustrations showing typical cases are included.

Those practitioners who live in the pella-

gra zone will find much of great interest and value in Dr. Niles's contribution, and those who do not live in this zone but who may be misled by sporadic cases, if they are not on the lookout for them, should possess and read it in order that a correct diagnosis may be made and proper measures instituted when sporadic cases are met with.

A TEXT-BOOK UPON THE PATHOGENIC BACTERIA AND PROTOZOA. For Students of Medicine. By Joseph McFarland, M.D., Sc.D. Eighth Edition, Revised. Copiously Illustrated in Black and White and in Colors. W. B. Saunders Company, Philadelphia, 1916. Cloth $4.00.

That a book dealing with so highly technical a subject as this should have reached eight editions in twenty years is not only a tribute to its excellence, but is also a tribute to the profession in general who have recognized the great importance of a knowledge of the topics with which it deals. Dr. McFarland has the happy faculty of expressing himself clearly, both by word of mouth and with his pen, and, because of these facts and his familiarity with the subject, a number of the editions have been reprinted so as to meet the demands of the market. Altogether the book covers more than eight hundred pages.

It will provide the general practitioner with all the knowledge that he needs upon the subject with which it deals, and it will provide the laboratory worker with the technique which will enable him to become a useful and skilful scientific investigator. The author not only gives the methods which he has found useful, but quotes freely from general literature on the subject, giving references so that those who are interested in any particular line of work can follow it still further.

NITRO BY HYPO. A Pep-tonized Tonic for the Physician. By Edwin P. Haworth. The Willows Magazine Company, Kansas City, 1916.

Under this extraordinary title the author tells us in his preface that so many words of commendation have come from the recipients of "The Willows Magazine" that he has deemed it advisable to gather together some of the choice inspirational articles and paragraphs from his files and to print them in book form. The author points out that the medical journals are usually filled with articles of scientific significance and all too little space is devoted to methods, business, inspiration, uplift, and he hopes that the volume will cheer the depressed and dispirited practitioner so that he will better fulfil his mission.

Various divisions, or chapters, of the book deal with such subjects as Service and Remuneration, Personality in Medicine, The Reading Habit, Religion and Medicine, Your Medical Library, Hardships and Ease, etc.

This book may be said to be in medical literature what Elbert Hubbard's "Philistine" was to the laity, dealing lightly and in an interesting way with various themes which more or less directly interest all medical men, and doctors in particular.

PAINLESS CHILDBIRTH AND NITROUS OXIDE-OXYGEN ANALGESIA. By Carl Henry Davis, M.D. Forbes & Company, Chicago, 1916. Price $1.00.

The great interest which has been manifested by the profession and laity in the subject of "twilight sleep" is apparently the stimulus of the author of this volume. We are a little in doubt as to the exact intent of the writer in inditing his pages, for some of the technical terms, and the journals quoted, would seem to indicate that the volume is meant for medical men, whereas some of the rest of the text, as, for example, the definitions which open the book, are apparently meant for the laity.

The book is dedicated "with tender memories to my mother and her patience in suffering."

The statement is made that the publishers will be pleased to supply an electrotype or photograph of the author upon request.

It goes without saying from the title of the volume that Dr. Davis is a believer in the relief of the pains of parturition by the means of nitrous oxide-oxygen rather than by the employment of hypodermic injections of morphine and scopolamine.

The publishers state in their prospectus that the author has been able to show that maternity is more dangerous to-day than

before the discovery of anesthetics and antiseptics, which would seem to indicate that any form of anesthesia is unwise.

INSTINCT AND INTELLECT. By N. C. MacNamara, F.R.C.S. Oxford University Press, New York, 1915.

In a small book of a little over two hundred pages the author starts out with the proposition that "educationists," to use his phrase, at the present time appear to exaggerate the importance of training the intellect and are apt to overlook the fact that each individual possesses certain instinctive qualities which, to a large extent, determine his behavior throughout life. These qualities which no human power can eradicate may, however, be favorably modified by appropriate training. In his text the author endeavors to give an outline of the evidence and the reasons upon which he relies to prove that the instinctive behavior of human beings depends on work performed by different parts of the brain.

There are seven chapters and an appendix. The first deals with Molecules and Atoms and with the Unicellular Organisms; the second with Multicellular Organisms; the third with the Nervous System of the Star-Fish; the fourth with the Nervous System of Higher Forms of Fish; the fifth with Conditions in the Mammalia; the sixth with the Brain of Man in his Various Types of Non-development and Full-development; and the last chapter deals with the Cerebral Cortex and the various changes or abnormalities of this part of the nervous system which are met with in certain individuals.

HYSTERIA AND ACCIDENT COMPENSATION. By Francis X. Dercum, M.D., Ph.D. The George T. Bisel Company, Philadelphia, 1916.

This small volume of a little over one hundred pages deals with the nature of hysteria and the lesson of the post-litigation results. The author has endeavored to present the subject of hysteria in as condensed and readable a form as possible. As the book is intended for legal rather than medical readers technicalities have been avoided as largely as possible, and a glossary of the terms which it is essential to employ is appended. There is also a list of thirty-eight important contributions to hysteria and kindred affections at the close of the volume.

Dr. Dercum has had a very large experience as a neurologist and an equal experience as a neurological expert in medicolegal matters; he, therefore, knows the needs of the legal profession and has been able to present an adequate summarization of this subject, which is particularly timely in view of the wide-spread application of the Workman's Compensation Act and the question of compensation for accidents and injuries on the part of travelers and others who may suffer injury at the hand of individuals or corporations.

A PRACTICAL TREATISE ON INFANT FEEDING AND ALLIED TOPICS. For Physicians and Students. By Harry Lowenburg, A.M., M.D. Freely Illustrated. F. A. Davis Company, Philadelphia, 1916. Price $3.00.

As Dr. Lowenburg throughout his medical career has devoted himself largely to the feeding and care of infants, he brings to the preparation of this book the result of considerable study and experience. The colored plates are remarkably good. Those showing the normal stool in an artificially fed baby and the stool of the child suffering from indigestion are particularly excellent, as is also that of the so-called green or spinach stool of infants. The book does not profess to be a scientific discourse upon disorders of nutrition in children, but a description of the variations from the normal which will be found by the general practitioner in his daily route. It can be recommended to those of the profession who desire a handy little volume to which they can frequently turn for useful information.

A REFERENCE HANDBOOK OF THE MEDICAL SCIENCES. By Various Writers. Third Edition, Completely Revised and Rewritten. Edited by Thomas Lathrop Stedman, A.M., M.D. Complete in Eight Volumes. Volume Six, Illustrated. William Wood & Company, New York, 1916. Price $7.00 cloth, $8.00 leather, $9.00 half morocco.

It is some time since volume five of this very excellent encyclopedia or handbook appeared. The fact that two large editions

have been published prior to this one has made the book familiar to many members of the medical profession. The present volume has many articles of great value, and the authors are, in nearly every instance, men of repute. The text extends from Lig to Oza, starting out with Ligation of Arteries and ending with Ozæna.

It is impossible to review a volume written by a great number of authors and covering nearly a thousand pages in which the entire range of scientific and practical medicine and allied science is considered. The book is of great value and a credit to the publishers and the profession. We hope that the other volumes can be completed before the first part of the series becomes too old.

INJURIES OF THE EYES, NOSE, THROAT AND EARS. By Andrew Maitland Ramsay, M.D., F.R.F.P.S. (Glasgow); J. Dundas Grant, M.D., F.R.C.S. (Eng.); H. Lawson Whale, M.D. (Camb.), F.R.C.S. (Eng.); and Charles Ernest West, F.R.C.S. (Eng.). Oxford University Press. Henry Frowde, London, 1915. Price $1.00.

This further contribution to the War Series begins with Injuries of the Eyes, in which Ramsay states the war injuries exhibited three chief complications—sepsis, tetanus, and sympathetic ophthalmia. The brief summarization of both emergency and subsequent treatment is as profitable for the general practitioner as for the military surgeon.

The section on Nose and Throat is contributed by Grant and Whale. There seems little in this contribution of special value to the military surgeon. Rather does it deal with the general principles of injuries involving these parts. There are appended to this section brief notes of some 38 cases. Concerning injuries to the ear, it is stated that rupture of the tympanic membrane is a not very uncommon war injury. The treatment advised is wiping out the external meatus and laying in a clean dusting powder and plugging with gauze. Thereafter the ear is let alone. Concerning deafness, it is considered to be remarkable with what completeness the possession of an antecedent middle-ear deafness seems to screen the ear from damage by explosion. The deafness due to rupture of the membrane and swelling of the tympanic mucosa is often very great and accompanied by pulsating, buzzing noises. The prognosis, however, is generally good. The distinction between destructive deafness and that of labyrinthine type depends upon the tuning-fork.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

In the hospitals we still have the same run of cases. A few frost-bites, nearly all of which occur amongst the blue-fingered type of soldier, a certain number of cases of shell shock, and some cases of rheumatism and so forth. The frost-bites vary in intensity, but are much milder than last year, and it is not at all common to see cases in which gangrene has set in. The milder cases only require about a fortnight in bed, and are then able to get about, but it is wise to take every precaution against the incidence of flatfoot in these cases. They are therefore massaged, and not allowed to stand on their feet too long for a further period of a fortnight. There are also a few cases of paratyphoid which have evidently escaped detection in France. These are remarkably mild, and the great difficulty is to make the individuals realize that it is necessary for them to lie in bed and to limit their dietary. There is an epidemic of measles and German measles in the country, which is producing a certain amount of illness amongst the troops in training. The civil population has naturally been affected also, and measles is now a notifiable disease. The Metropolitan Asylums Board do not take in cases of measles as a rule, but are making an exception in the case of the military, and are

preparing to receive soldiers notified as cases of measles, and to treat them at the ordinary fever hospitals.

The organization of the medical profession is proceeding. The Central Medical War Committee are endeavoring to find out the greatest number of medical men below the age of forty-five who can be spared from their private, public, and hospital duties. The committee are in close touch with the Director-General of the Army Medical Service, with the Insurance Commission, with the Local Government Board, and with the Board of Education. The difficulty in connection with the hospitals is that all the recently qualified men immediately take commissions. A few of them are seconded for a period of three months or so to posts of house surgeon or house physician. These residents therefore form a reserve, from which men are to be called up in case of an emergency. Should such occur, the hospitals would be left without any qualified residents, and in some cases it is anticipated that the younger members of the staff will take the place of the residents thus called out. This will be preferable to allowing senior, but unqualified, students to take the posts vacated.

Much good work is being done under the auspices and guidance of the Medical Research Committee. It will be remembered that this committee was formed in connection with the National Insurance Act, and from the funds of this body it receives a capitation grant. Prior to the war, the Mount Vernon Tuberculosis Hospital, which had been closed, largely on account of lack of funds, had been acquired for the purposes of the Medical Research Committee, and it was proposed to institute a large research into the question of tuberculosis at this institution. With the onset of the war, these plans were considerably altered, and the hospital itself was placed under the War Office, as a hospital for the wounded. The proposed research into tuberculosis was for the moment abandoned. The Medical Research Committee, however, has not abandoned its activities, but has inaugurated a number of schemes of research in connection with the war. Amongst these are to be reckoned a Bureau, now being established, to collect and collate the sickness statistics from the various fields of activities. This will be a very big business, for it is quite certain that a lot of sorting out of material will be necessary, owing to the hurried manner in which cases have to be evacuated, so that the valuable and reliable histories and medical sheets will be collected and retained. It is also proposed to produce a History of the War in its Medical Aspects. Many other researches have been started, amongst the most successful of which, that dealing with fatigue and industrial work, may be considered of value. Amongst the purely medical investigations those connected with nephritis, trench frost-bites, and soldiers' hearts are at the present time being carried out in various institutions. For this purpose such cases, when diagnosed in France, are sent over here to those institutions in which such work is being undertaken, and are thus brought near to the laboratories instead of being scattered in a haphazard fashion over the country generally. A large part of the functions of the committee are expended in providing skilled investigators to assist those appointed to take up any particular branch of investigation. It will thus be seen that the work of this committee is spread over a number of different objects, and as far as I know it is the first really combined attempt toward the organization of research, and government support of such an organization, in this country.

I have in previous letters referred to the employment of women in posts previously held by the men. With the calling out of the Derby recruits a far larger proportion of women will naturally be employed than formerly. Committees are being formed in country districts to go round and organize female labor to assist various industries, amongst which the farming industry is to be reckoned one of the most important. The difficulty in the country districts lies in the fact that a woman cannot readily leave her house each day, but it seems quite

feasible for her to leave her house every other day, so that with a small amount of arrangement it will be possible to supply one unit of labor from every two women in the villages. The country laborer is proverbially slow at his work. A very good instance of this was brought home to me the other day, when I met a friend who supervises a farm of 500 acres, on which prior to the war eight men were employed. Five of these have joined the army since the war began. He now pays each of the remaining three a wage and a half, and finds that the work is done practically as well as before. He does not anticipate in the future employing as many men as previously. Among other occupations taken over by women, that of the van-driver with a horse or motor commands attention. There are now almost as many vans driven by women as by men, especially in those businesses where the packages to be delivered are not of great weight. I have also seen two women ticket-collectors on busses, one of whom was dressed in a resplendent khaki uniform. The post of laboratory assistant and medium making can also be carried on easily by women, and the old saying that women could cook anything except a bacterial medium has already been falsified. An attempt was also made by some firms of window-cleaners to employ women instead of men. This apparently was not successful.

NOTES AND QUERIES.

THE HARRISON LAW.

HEMENWAY in the *Bulletin of the Chicago Medical Society* of February 12, 1916, makes the following report:

In order to understand such a document as the so-called Harrison law, it is necessary to remember that as yet the United States does not have full sovereignty over its territory. By the ninth and tenth amendments all power not distinctly given to the Congress is reserved to the individual States, or to the people. What is ordinarily called "police power" is therefore reserved to the States, and in so far as the National Government desires to exert police power it must do so indirectly.

Recognizing the harmful effects of the opium trade, in 1909 in a council of representatives of the principal nations at Shanghai, the United States set on foot concerted international efforts to restrict this trade in opium and its products. In the furtherance of this object Congress has passed certain laws.

Heavy duties and restrictions upon importation tend to make it an object for certain people to import contrary to law; and to prevent this smuggling a law was passed which makes punishable the receiving, storing, or secreting opium imported contrary to law. It was claimed by the offenders that the United States had no jurisdiction in the matter. That after the opium was once in the State, and thus mixed with the merchandise of the State, it was only within the police power of the State, except in so far as it might be subject to national tax. The United States Circuit Court of Appeals held that under the power to regulate interstate and foreign commerce, the United States has power to make the receiving, concealing, buying, or selling of such opium punishable, and upheld conviction under the statute. (Steinfeldt *v.* U. S., 219 Fed., 879; also U. S. *v.* Caminata, 194 Fed., 903; Jung Quey *v.* U. S., 222 Fed., 766.)

The statute of February 9, 1909, prohibited the importation of opium after April 1, 1909, except under certain conditions. Opium found in the possession of any one when unlawfully imported was subject to seizure, and the burden of proof was upon the holder to show lawful ownership. By a subsequent statute it was provided that all opium found after July 1, 1913, should be presumed to have been imported after the said first day of April, 1909, "and the burden of proof shall be on the claimant or the accused to rebut such presumption." An

aged Chinaman was found with 2¾ pounds of smoking opium in his possession. He testified that he bought the opium on the street in Butte, Montana, and paid $100 therefor. He was therefore tried and found guilty of receiving opium imported contrary to law. He asked for a new trial, on the ground that he was deprived of liberty and property without due process of law. The United States District Court, however, denied the petition and upheld the conviction. In the course of the decision the court said:

"The court takes judicial notice that opium is not commercially a domestic product. Perverted to evil uses, it is in general an outlaw. Its presence in this country, apart from statutes, is practically a conclusive presumption of importation. Presence and possession in the accused invoke the statutory presumption that he imported it, or received it after importation. And since its importation is unlawful these six years, in view of its nature, the statutory presumption that it was imported within the said period and to the knowledge of any one receiving it is not unreasonable, to the extent hereinbefore indicated." (United States *v.* Yee Fing, 222 Fed., 154.)

The holder must be prepared to show lawful ownership.

The gist of these decisions is that goods imported contrary to law are not properly a part of the merchandise of the country so long as they may be traced; but it may readily be seen that by a frequent change of ownership and storage this difficulty of tracing would be very great. Consequently, the so-called Harrison Antinarcotic Act was passed by Congress in this suppression of smuggling. Though the incidental effect of the law may be an aid to those who are endeavoring to check drug habits, and although the law has been seriously misused by both honest and dishonest upholders of its provisions, the purpose of the law is to aid in the collection of the government tax upon imported products.

This aid is in two ways: First, all persons, with slight exceptions, who keep, sell, prescribe, or dispense opium or its products, or cocaine and similar habit-producing drugs, are required to pay a special tax, and receive a special license annually. This enables the officers of the government to enroll lawful handlers of the drug, and concentrate their attention upon certain members of the community; and if others be found with the goods in their possession the presumption is that they have them unlawfully.

Secondly, all persons receiving the license are required to schedule at certain dates all such drugs in their possession, and the transfer of such articles is regulated by the requirement of such records that the goods may be traced from place to place. If an unlicensed person be found with the drug in his possession it is presumptive evidence of guilt; and if a licensed person be found with more of the drugs in his possession than accounted for, it is presumptive evidence that he is using the drugs unlawfully.

The purpose of this drug act is expressed in its title: "An Act to provide for the registration of, with collectors of internal revenue, and to impose a special tax upon, all persons who produce, import, manufacture, compound, deal in, dispense, sell, distribute, or give away opium or coca leaves, their salts, derivatives, or preparations, and for other purposes."

In U. S. *v.* Jin Fuey Moy, 225 Fed., 1003, Judge Thompson, of the Western District of Pennsylvania, said: "This is a revenue act; unless it is such, save as to those provisions which relate to the transportation of the drugs in interstate commerce, it would perhaps violate the provisions of the Constitution of the United States." In U. S. *v.* Woods, 224 Fed., 278, Judge Bourquin, of Montana, based his whole argument upon the Act as a revenue act. It does not attempt to regulate the practice of medicine. It simply provides certain requirements which must be observed by physicians when they prescribe or administer these habit-forming drugs. The law does not say that a physician shall not administer or prescribe morphine to a morphine eater, nor does it put a limit upon his prescription.

In U. S. *v.* Friedman, 224 Fed., 267, the

defendant had been indicted for a supposed violation of the Harrison Act. The claim was "that he distributed, dispensed and prescribed the aforesaid drugs in quantities more than was necessary to meet the immediate demands of a patient, and did not distribute, dispense and prescribe the drugs in good faith and as a medicine." The indictment was quashed by the United States District Court for Western Tennessee, the court saying: "I fail to find in the Act of Congress under examination any language making the doing of the things with which the defendant is charged a violation of law."

It will be noticed that the Act calls for the registration of those who manufacture, import, sell, or prescribe, or give the drugs in question, but nothing is said of those who consume them. It is a rule of the courts that a statute must be construed as a whole, and giving the entire statute, if possible, a constitutional interpretation. This act makes the doing of certain things, or the failure to do certain other things, punishable. The courts therefore construe the law more strictly.

An opium smoker was arrested for failure to register and to pay the tax. It was admitted that the defendant was found with opium on hand, and the government did not attempt to claim that defendant either sold or gave away the drug. She was indicted. The U. S. District Court, Montana, dismissed the indictments, and discharged the defendant. The indictment was based on section 8, "all persons," but the court said that "taxes can be imposed and statutory offenses created only by direct, clear and apt language." The list of those to whom the law should apply is in section 1, and consumers are not there mentioned. (U. S. *v.* Woods, 224 Fed., 278.) The District Court of Western Tennessee and that of Western Pennsylvania also held that the possession of opium or its products, by one not registered and licensed, was not unlawful under this act, so long as the drugs were for personal use. (U. S. *v.* Wilson, 225 Fed., 82; U. S. *v.* Jin Fuey Moy, 225 Fed., 1003.)

Either directly or indirectly those who are bringing cases to the attention of the officers have been basing prosecutions against physicians upon the supposed fact that unregistered users are violators of the law. The attempt has been made to indict physicians for having conspired to aid drug habitués to violate this section 8. So far the decisions published have been unanimous against this claim. (U. S. *v.* Jin Fuey Moy, 225 Fed., 1003.)

A physician wishing to prescribe or dispense morphine or cocaine must annually pay to the Collector of Internal Revenue the sum of one dollar. He must make an application for a license upon a prescribed form, with an affidavit showing that he is entitled to receive the license. He must also purchase from the Department blank orders to be used in buying these specified drugs. He should hang his license where it may be seen in his office. To purchase the drug, the physician must make out an order in duplicate, properly signed and dated, and he must preserve his duplicate for two years.

Physicians dispensing these drugs must keep a record of all such drugs dispensed or prescribed, and the date. (By a ruling of the Department where minute quantities are used, as in a spray, the physician is permitted to record when the spray was made, and how much of the drug was thus used, and when that lot was exhausted.)

When physicians write a prescription for any of these drugs mentioned in this act, the name and residence of the patient and date should be given. A record is not required by law to be kept of such prescriptions by physicians, but the druggist must not honor such prescriptions issued by those who do not hold the special Harrison Act license, and when the prescription is honored the druggist must preserve it for two years. A physician is not required to make a record of drugs actually administered while making calls. It is better, however, to make such record, and to preserve carbon copies of all prescriptions calling for opium or cocaine or their derivatives. It is a reasonable ruling, though not within the pro-

visions of the law, which requires physicians in writing prescriptions for these drugs to append thereto their personal registration number. This is the number written on the license, not that stamped thereon. This number is an evidence to the druggist that the physician holds such a license, and it enables the officers to detect violators.

A prescription may be considered as an "order," and with that interpretation it is necessary that the copy of the prescription calling for opium, etc., must be preserved for two years. This was the interpretation put upon the act by the District Court of Northern Ohio. (U. S. *v.* Charter, 227 Fed., 331.) "He rightfully construes the provisions quoted as providing that physician is excused from failing to keep on file for inspection a duplicate of an order given by him to the patient only when he keeps a record of his own dispensing, which record may be inspected as provided in the act." The physician was held because he neither preserved a duplicate of the order nor made a record of dispensing.

A physician's prescription calling for opiates must contain the name and residence of the physician. It should be signed by his "full name," but that expression is taken to mean such a signature as he would use for a bank check.

Though by special exception in section 6 the Harrison law does not apply to the sale, etc., of remedies containing less than two grains of opium, or a quarter of a grain of morphine, etc., per fluidounce, this exception is taken to mean proprietary or standard preparations. The exception does not apply to physicians' prescriptions calling for any quantity of morphine, unless that morphine be contained in some standard preparation.

The representatives of the Internal Revenue office and the Assistant District Attorney in charge of the work assure us that no reputable physician need fear prosecution so long as he observes the law as written. The physician would be given the benefit of every doubt. It is the desire of the department to check the operation of quacks and habit-producers. In this desire the members of the Chicago Medical Society will be found in hearty sympathy. However, we are convinced that the officers in the Internal Revenue Department are attempting to exceed their authority, and in so doing they are dependent solely upon their own arbitrary standards. If it be not illegal for drug users to have personal supplies on hand without license, there can be no "conspiracy to commit a crime" in giving to such habitué a prescription calling for morphine. A prosecution depending upon the whim of the officer may be the means of doing almost irreparable harm to the reputation of a physician.

The direct restriction of the drug habit, being a function of the State under its police power, should be attained through State enactment. In the enforcement of the State law the operation of the Harrison Act will be an aid. Also the State law will often enable the national officers to trace illegal drugs. Neither representatives of the Internal Revenue office, nor of that of the Department of Justice, mentioned a single reported case contrary to those herein cited, though the direct question was asked them. The most that they could say was that they hoped to get these decisions set aside by the higher courts. The unanimity of decisions from all sections of the country, as well as the known principles of constitutional law, indicate that the present decisions will be sustained. The law is constitutional as it stands, being for the purpose of enabling the government agents to trace illegal drugs. The attempt to apply it in limiting the treatment of cases by physicians is a clear violation of constitutional principles.

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ORIGINAL COMMUNICATIONS.

COMMON AFFECTIONS OF THE NOSE AND THROAT—THEIR EARLY RECOGNITION AND TREATMENT.[1]

BY CHARLES PREVOST GRAYSON, M.D.,

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The first difficulty that confronts one in preparing a contribution for a general meeting such as that of this evening is that of choosing from among the many diseases of the nose and throat those the consideration of which will prove of the greatest practical interest to a non-specialist audience. The "common affections" to which we are limited by the title on the programme is, however, indulgently indefinite. It may mean those that are of most frequent occurrence or those that are of only trifling significance, but whatever meaning we may assign to it, it is always to be remembered that however commonplace and apparently innocent in themselves a certain group of affections may be, there is not one of them that is not potentially as grave and menacing as those that are initially serious.

It seems to me that it would not be making the best of this opportunity, it would not be giving you a proper return for the compliment of being invited to address you, if I confined my paper to such time-worn topics as coryza, hay-fever, or adenoid growths. Interesting as these may be in the abstract, I know that in the concrete you are already sufficiently familiar with them to recognize them promptly and to make no mistakes in their treatment. I am inclined, therefore, to select those affections that are more or less intimately associated with the broad field of internal medicine, not forgetting, however, that in doing even this there is scarcely any diseased condition of the nose or throat that is entirely free from such association. If we exclude traumatism and its immediate effects, there is scarcely any disturbance of this region that has not its malign influence upon the general health or that has not some systemic factor more or less intimately concerned in its etiology. Within even the past decade the rise in medical estimation of the vital importance of nose and throat diseases has been extraordinary. From comparative obscurity it has climbed to its place in the sun with astonishing rapidity, and the physician who does not now recognize the diseased nose or throat as a possible if not frequent factor in a large number of organic or general pathologic processes is, to say the least, not in advance of the procession of scientific medicine. Of the disorders of the upper air-tract practically all are accompanied by more or less vascular disturbance, secretory derangement, and nerve irritation, and by perverted sensibility and impaired or exaggerated nutrition of the mucous membrane. The merely local symptomatic expression may be of small moment, but when we remember that such pathological features render the tissues of this region much less resistant to the many infective organisms to which they are constantly exposed, and when, in addition, we remember that because of certain well-known anatomical peculiarities local infection here almost always means varying degrees of secondary systemic infection, we should

[1]Read at a general meeting of the Philadelphia County Medical Society, November 24, 1915.

have no difficulty in realizing that either delayed recognition or injudicious treatment may, in a pathological sense, quickly transform the insignificant mole-hill into a very formidable mountain.

A full appreciation of the serious possibilities of these primarily trivial disorders is also the more desirable because so brief a time is required for their establishment as chronic processes. This implies not alone their increased resistance to remedial measures, but an increased susceptibility on the part of the individual to acute exacerbations. In spite of these established facts, are not many of us apt, for instance, to regard rather lightly a child's first coryza, to deprecate anything in the way of treatment, to ignore even the simple prophylaxis that might protect it from subsequent attacks? And yet when this neglected first attack leads, as it too often does, to a second and this to a frequent succession of them, each in all probability more severe and prolonged than the last, the lid is off of that child's upper air-tract, its nose closes, its mouth opens, and any prowling coccus or bacterium that pleases may enter freely and find not only a warm but a most nourishing welcome. You know perfectly well the extraordinary activity of the lymphoid elements of the mucous membrane of the child, you know upon what slight provocation this may become exaggerated to a pathologic degree, and you will anticipate at once the almost inevitable hyperplasia of Waldeyer's ring that follows upon the development of the child's chronic rhinitis. You will not have to wait long for the symptomatic announcement of adenoids, of hypertrophy of the tonsils and a low-grade catarrhal inflammation of their lacunæ, and for the beginnings, perhaps, of that systemic sepsis that may end in widely disseminated areas of secondary disease. Moreover, recalling the anatomical fact that the Eustachian tube of the child is shorter, straighter, and more patulous than that of the adult, we need scarcely be surprised that otitis media becomes a frequent or even usual accompaniment of every infection to which chronic inflammation has rendered the child's nose and nasopharynx so easily liable.

In this connection, it seems to me that, if we are ever to be successful in stamping out, or diminishing to any great extent, the scourge of deafness, success must come through our solicitous care of the upper air-way in early life. The results of what has already been done in this way will be, I am confident, distinctly evident within the next generation or two. The municipality is doing work of inestimable prophylactic value in its inspection of the public school pupils, and if this service could be extended to the homes of the poor and the noses and throats of their children intelligently cared for at an even earlier age than that of school attendance, is it not almost a certainty that we would have fewer outbreaks among them of diphtheria, the exanthemata, whooping-cough, and epidemic sore-throat? In all likelihood the so-called "backward child" would become in time much more of a curiosity than he now is, and likewise the boy or girl with impaired hearing, two achievements of sociologic as well as medical importance.

And speaking of diphtheria and the exanthemata, it would be interesting to know the proportion of internists who are really energetic in their care of the nose and nasopharynx during the course of these diseases. There can be no question that those who are careful to maintain an approximate asepsis of these cavities have fewer cases with complications, with prolonged and severe pyrexia, and with regrettable sequelæ than those who are indifferent about it. The reason for this is anatomically obvious. In air-borne infections the nose represents our first line of defense, and when it is weakened by acute or chronic disease and fails to prevent the transit of a bacterial enemy, the nasopharynx becomes its first halting place and serves it as an undisturbed and admirably adapted station for further recruiting its numbers. I say undisturbed because the walls of this chamber are rigid, peristaltic movement does not extend above the palate, the cavity is almost wholly lined with squamous, not ciliated,

epithelium, and for purposes of drainage nature seems to have relied almost entirely upon the force of gravity. In a state of health when this space is constantly flushed by a limpid stream of normally blended serum and mucus, this means of drainage is without doubt ample, but when the glandular mixture is disturbed and the proportion of mucus becomes excessive, drainage may be retarded almost to the point of arrest. A moments' thought that will recall the rich deposit of lymphoid tissue in this region, its ready permeability, and the ease and rapidity with which the lymph stream will sweep bacteria and their toxins into the general blood current, will be quite enough to convince you of the supreme sanitary importance of nasopharyngeal cleanliness.

I do not propose to run the risk of telling you for the hundredth time what you have probably heard that often about adenoid growths, but while sparing you this, I am afraid that I am taking the same chance in saying a hurried word about the nasal accessory sinuses. Though you may not care to undertake the treatment of acute or chronic disease of these cavities, yet surely it will not be unreasonable of your patients to expect you to recognize without loss of time the existence of disease within them. Even should you not be possessed of the moderate technical skill necessary for a rhinoscopic examination and the discovery and localization of the usual purulent discharge, yet if you are sufficiently familiar with the several other clinical symptoms to have your suspicions aroused, a radiograph will greatly help to confirm or confute them, and, in addition, for the investigation at least of the frontal and maxillary sinuses the transillumination test may be as readily applied by the internist as by the rhinologist. A dark closet and the inexpensive apparatus needed for this test will add very materially to your diagnostic resources. It is not at all uncommon for the victim of a simple acute coryza to complain in a more or less casual way of a dull generalized headache, but when that ache becomes concentrated over the region of one or other of the sinuses and his casual complaint is transformed into one that is very apt to be profanely emphatic, when he is conscious of a sense of persistent fulness and pressure in the upper part of the nose, and this is accompanied perhaps by a degree or two of temperature elevation and a unilateral increase of the nasal discharge, the chances are that an infective organism has found its way into the suspected sinus and that there is some obstruction to the escape of the ensuing inflammatory products. The very essence of treatment in such cases consists in reëstablishing drainage and maintaining its freedom until the disturbing agents have been destroyed and cast out. I do not wish to shake your faith in the at times almost spectacular remedial value of vaccines, but I cannot say to you too positively that be the sinus inflammation acute or chronic, unless you first and foremost provide for adequate drainage you might as well fill your syringe with distilled water. Although it would be scarcely appropriate to class the chronic sinus empyemas among the "common affections" of the nose, yet they are by no means uncommon, and they are so important both in their immediate and secondary effects that they certainly merit being classed among those affections that you should quickly recognize.

Of the four sinuses, those that should be of by far the greatest interest to the internist are the ethmoid and sphenoid. With no more than a passing reference to the general sepsis that may proceed from their chronic purulent inflammation, I wish particularly to focus your attention on certain of the local and reflex disturbances to which disease of them may give rise. You are no doubt already well acquainted with the persistent dull headache and the neuralgias that ethmoidal disease may occasion, and when as a further result of a prolonged purulent discharge from this aggregation of cells we have an enlarged and degenerate middle turbinate, fringed perhaps with mucous polyps filling and closing to a great extent the upper half of the nasal fossa, is it not almost a mechanical certainty that we

will have serious interference not only with ordinary drainage but also with the venous and lymphatic circulation at the base of the brain, and as a consequence of this, many of the psychic phenomena that make up the depressing symptom-complex of aprosexia?

If I limit myself to but one of the several reflex disorders that may ensue upon this combination of ethmoidal and middle turbinate disease, I should say that asthma was the most frequent and deplorable. And with reference to this distressing disease I wonder how many of you could plead guilty to having treated one or more cases of it for weeks, or possibly months, without any great success, and yet without ever having thought of investigating the nose as a possible causative agent. Even though we may grant unreservedly that many cases of bronchial asthma are examples of anaphylactic reaction to certain protein molecules, yet, if clinical observation be worth anything, we are certainly justified in believing that a much larger number are due to some variety of intranasal disease.

As to the sphenoid sinus, your interest will be mainly concerned with the pernicious influence of its diseased conditions in the causation of persistent headaches and neuralgias and of functional disturbances of the third, fourth, fifth, and sixth cranial nerves. The studies of Haskins, Sluder and Onodi have clearly established the pathological relationship of the diseased sphenoid to these secondary affections that I have mentioned. Our greatly increased knowledge of the pathology and our quickened perception of the symptoms of hyper- and hypopituitarism, and the fact that the nasosphenoidal route for hypophyseal surgery is in many cases unquestionably the best, make it a matter of importance that you be so well informed concerning the regional anatomy of this sinus that you will promptly recognize the symptoms which its disease may provoke.

In spite, again, of the grave danger of exhausting your patience, I am going to make a very brief and merely incidental contribution to the literature of the tonsils. It is only in the way of emphasizing a portion of what I know you have already heard more than once. No one can have read the comparatively recent papers of Billings, Murphy, and Rosenow—an exceptionally strong and well-balanced trio of internist, surgeon, and pathologist—their papers dealing with the frequency and vital seriousness of focal sources of general systemic infection, without having been deeply impressed by their studies. Whether these foci are found in the tonsils, the accessory sinuses, the prostate, the appendix, or the gall-bladder is for my present purpose immaterial. The point of transcendent importance is that in the presence of certain types of infectious disease, general or local, these foci should be immediately and most carefully searched for, and the well-established fact that in by far the largest number of cases they will be found in the crypts of the tonsils will serve as my excuse for once more directing your attention to these glands. Nor can I dismiss them without an expression of genuine enthusiasm over the radical change for the better in the method of their removal as it is practiced to-day. I do not know of an operation the technique of which has been so rapidly perfected as has that of tonsillectomy. Its practically immediate and universal acceptance as a major operation made this technical improvement compulsory, and the large number of men who have contributed to the clear understanding of its anatomical and surgical details deserve most generous credit. As results of their work the risks of the operation have been minimized and the regrettable accidents and the injuries of the important surrounding structures that were rather frequent during its introductory years have now become conspicuous by their rarity. It was not surprising, as a consequence of these unfortunate mutilations and their possibly evil effects upon the quality of the voice and the ease and distinctness of articulation, that quite a number of eminent laryngologists should have raised their authoritative voices in criticism and with a hint of disapproval of the operation; but however well deserved criticism may have been even, perhaps, as recently as

a year or two ago, I think that it may now be successfully challenged by the brilliant work of scores of men in this and other cities. It has now become so clearly apparent that incidental injuries of this kind can be entirely eliminated by care, deliberation, and the skill that practice has developed, that hereafter the shafts of criticism must be leveled not at the operation but at the operator.

And now a concluding word about the larynx and the usefulness to you of the laryngeal mirror, and I am through. This valuable little aid to clinical examination would often serve you as the means to the early recognition, and the treatment also, of many serious conditions. The one symptom of hoarseness or aphonia might lead you through its use to the prompt diagnosis of tuberculous, late syphilitic or cancerous ulceration. It would enable you to at once distinguish between the functional aphonia of hysteria and that due to an acute laryngitis, to the presence of a neoplasm or to myopathic or neuropathic conditions of perhaps serious significance, and finally it would bring to your eyes the pressure palsies of the recurrent nerve incident to aortic aneurism, bronchocele, or disease of the mediastinal glands. For these and many other affections the laryngeal mirror would be to internists of such frequent and very great diagnostic value that I wonder its use by them is not a matter of daily routine.

I am uneasily conscious that I have not strictly observed the bounds that were intended for this paper, but I trust that in transgressing them I have not entirely wasted your time.

262 S. 15TH STREET.

THE GENERAL PRACTITIONER AND OBSTETRIC SURGERY.[1]

BY EDWARD P. DAVIS, M.D.,
Professor of Obstetrics in the Jefferson Medical College of Philadelphia.

In discussing this subject we fortunately can start from a common ground. Our profession always puts foremost the interest of the patient, and hence this shall be our first point of departure.

Who shall do obstetric surgery? Where and how shall it be done in the interest of mother and child?

It has lately become apparent that there is a distinct field of medical science known as obstetric surgery. We have long been familiar with the usual obstetric operations whereby delivery is effected through the vagina, but recently a new branch of this department has been opened in delivery by abdominal section. The word Cæsarian section no longer conveys accurately the many complications and varieties of procedure which delivery by abdominal section embraces. Even Cæsarian section itself without sterilization may now be done in six different ways, and when to these we add the various operations by which the whole or greater part of the uterus is removed, the procedures necessary when a pelvic tumor complicates pregnancy, when appendicitis, ectopic gestation or pyosalpinx is present, it will be seen that the field is a considerable one. The obstetrician is the one man who can best deal with these cases. The general surgeon and the gynecologist may have ample technical skill, but they have not experience with pregnancy and parturition and they are unable to form an accurate choice of the best method of operation, and hence their performance of these operations is often followed by unsatisfactory results. There will always be needed a sufficient number of obstetricians attached to hospitals throughout the country who can be summoned to these cases whenever the emergency arises.

Obstetric surgery is best performed in a well-appointed maternity hospital. The general hospital has no suitable appliances for resuscitating and caring for the newborn child, nor are its nurses skilled in caring for obstetric cases. In emergencies a

[1]Read before the Medical Society of Orange, N. J., March 14, 1916.

hospital may be improvised in the house of a patient, but the performance of an operation in these surroundings is always attended with greater difficulty and greater risk than in a hospital.

Obstetric surgery should be done with the assistance of trained anesthetizers and helpers who have had experience in this branch of medicine. Patients undergoing delivery by abdominal section have variations in breathing, blood-pressure, and heart action which are not always seen in other cases. Where delivery is effected through the vagina, the problem of the prevention of postpartum hemorrhage at once arises and the obstetric anesthetizer must make this part of his duty.

It may be thought that these precautions—the services of an obstetrician, a maternity hospital, and skilled assistants—are required only for exceptionally complicated and severe cases; but let us take for a moment the most common of all obstetric operations—delivery by forceps. The patient is a primipara, not well developed, whose strength becomes exhausted when the head of the child has reached the pelvic floor but has not rotated. Considerable laceration is inevitable, and there will be more or less weakness or shock accompanying delivery, and postpartum hemorrhage and septic infection may easily begin at this time. Furthermore, if the operation is to be completed successfully, it must leave the mother with her injuries entirely repaired. This must include repair of a torn cervix and both anterior and posterior segments of the pelvic floor. These cases usually require intrauterine packing with iodoform gauze and stimulation to prevent postpartum hemorrhage. The child may be somewhat asphyxiated from birth pressure and will require additional care in resuscitation. To accomplish all this satisfactorily, promptly, safely, and skilfully, the services of the same staff will be needed which are required for delivery by abdominal section.

When the statistics of good maternity hospitals are compared with those obtained in private practice, and the same class of patients in both is subjected to critical study, the results are vastly in favor of the maternity hospital and its trained staff.

Not only do the complications of labor require expert care, but the emergencies of pregnancy are equally important. The toxemia of pregnancy in its wide range from pernicious nausea to eclampsia, or hemorrhages of pregnancy from threatened abortion to accidental separation of a normally implanted placenta or placenta previa, and pregnancy complicated by serious heart lesions or by colon bacillus infection of the kidney, all demand especial care. Can any one deny that these cases will do best under the care of an obstetrician in the hospital and with skilled assistants?

It may be of interest to consider how obstetricians may be trained and how such expert service may be rendered available to the public.

It is a familiar saying that the medical school does not train specialists. Its function is to lay a broad and solid foundation and to give each student the essentials which will make him, in the eyes of the law, a man of average medical knowledge and skill. The field of medicine during his student days is fairly well covered by the instruction which the students receive. Many go through this without manifesting especial aptitude or liking for any one branch of medicine. Some are attracted by the spectacular element in the various branches of surgery, and others by the interest which attaches to laboratory investigation. During the hospital year the student can further extend his experience, and if he has not already made a choice may find himself inclined in one direction. If he is attracted by obstetrics and the diseases of infancy, he should then take especial courses at some large maternity hospital like the Lying-in Charity of New York. He must not only be a student in such a place, but become an assistant and thus gain the practical experience necessary for a competent operator. He may then choose his future home, and from the beginning devote himself to his chosen work.

It cannot be expected that our smaller hospitals will have large and elaborately

equipped maternity wards, but in Pennsylvania the laws of the State now require each hospital to have a maternity service, and throughout the country even the smaller hospitals are making some provision for this purpose. As the population grows more dense, hospital facilities for obstetric work will increase.

But where in all this plan for the advancement of obstetrics does the general practitioner come in? Has he no interests which are rightfully to be considered in this matter? He is the family physician, and is he not then preferred by the mother of the family to be her personal attendant in confinement?

I have been repeatedly told by general practitioners of much experience who have large and lucrative practices that they did not desire obstetric work. The reasons given were that it interferes with general practice; that if a physician has a long and tedious confinement, he cannot during this time do justice to a patient very ill with pneumonia or typhoid; that confinement cases interfere with the office practice, which is so important a part of the work of the general practitioner; and that the general practitioner is not fitted with the necessary instruments, appliances, and assistants to do this work satisfactorily to himself and advantageously to the patient. Furthermore, it is, I believe, a general rule in medicine that a man will be truly successful only in that work which he does thoroughly and persistently well. It is true that a general practitioner may conduct a number of normal confinements successfully, and then meet an emergency or abnormality which may result in disaster and cause him loss and censure. For these reasons I believe that it is the opinion of certainly many general practitioners that they do not want obstetric work, but obstetric work will come to them to some extent inevitably. They will often be called upon to diagnosticate pregnancy, to treat threatened abortion, to treat the beginning of toxemia, and often to conduct labor. In beginning practice a physician may not be able to decline this work, and he may feel obliged in order to build up a practice to take this responsibility.

There is one field of medicine which belongs more than any other to the general practitioner, and that is the field of diagnosis. This is true throughout his entire work. It is to the family physician that the patient first tells the symptoms of cataract, cancer, abdominal tumor, serious disease of the viscera, disorders of the nervous system, and pregnancy and its complications. His field of diagnosis embraces practically all medicine. He is greatly to be envied in this, for his constant study of diagnosis should make him broad-minded, keen to observe, accurate in memory, and wise in decision. The specialist may well envy him in his specialty, that of diagnosis.

In no branch of medicine is diagnosis more important than in obstetrics. Accurate diagnosis at present constantly calls upon the laboratory, and the general practitioner to be successful must have access to a laboratory or must improvise one in his own home. He must be familiar with the ordinary microscopic work and possess the necessary outfit to make the most valuable clinical tests. If he is equipped with a modern education, the general practitioner will measure the patient's pelvis in her first pregnancy and early detect any abnormality in the size and shape of the pelvis. He will recognize altered pulse tension and other signs of toxemia of pregnancy. He will diagnosticate colon bacillus infection of the kidney during pregnancy, and also appendicitis. The diagnosis made, he will refer the patient to a hospital where appropriate treatment can be procured.

If one observes closely his patients, he must be impressed with the fact that they appreciate a thorough examination and an accurate diagnosis. So the general practitioner in his specialty of diagnosis is by no means overshadowed by the operator. The patients realize that but for his thorough and careful study and wise decision both mother and child might have been in great danger. There is no fear that such a physician will lose the household practice of the family, but the mother will return to

him convalescent and with increased faith in his ability and judgment.

Let us remember in this discussion that we are living in a thickly settled portion of our country, and that you, as citizens of New Jersey, are favored with excellent roads. We must also remember that in this part of the country there are many hospitals, and that it is rare to find a locality from which a patient cannot be quickly transported to a hospital. The motor car, whether it be ambulance or the ordinary car, has greatly increased the efficiency of our hospitals. Patients in labor can be transported to hospitals quickly, safely, and without injury to mother or child. It would seem then that certainly in this locality the conditions are favorable for obtaining for parturient women the advantages of skilled service and hospital care; but what shall we say of those parts of the country where hospitals are comparatively few, where roads are bad, where the foreign population insists upon midwives, where there are few obstetricians? Must the general practitioner still assume the responsibility of obstetric surgery?

We scarcely realize, until our attention is called to it, the number of medical men in America who have had hospital training who are competent in various branches of surgery. We are all familiar with the American College of Surgeons and recognize it as a splendid institution, and yet one's first impression may be that he had no idea that there were so many surgeons in America. These men have been selected after careful test, and they are unquestionably entitled to their position. Their number is not in proportion as great as that of the members of the Royal College of Surgeons of England, yet we have an enormous country in extent and a large population.

So in obstetrics, while the majority of each graduating class may remain general practitioners or go into other specialties, there is an increasing number of recently trained men who are becoming obstetricians. So hospitals are steadily increasing throughout the country, and it will not be long before it will be the exception and not the rule that obstetric surgery cannot readily be done in suitable hospitals. There is no place for the midwife in a highly civilized country where the medical profession has its full rights and privileges and where obstetric practice is properly conducted.

There is another modern and most interesting field for the general practitioner in the practical application of the science of hygiene. He is the guardian of the homes of his patients; he is the man to be on boards of health, on school boards, on commissions which have to do with the sanitation of artisans, with questions of immigration, and other matters concerning the public health. He also is the modern exponent of sociology, and he it is who will have the most use of the social service worker, who is a modern recruit in the ranks of medicine. His, too, will be the care of food supply or pure water and other matters important for the general welfare. His best success in medicine will lie in the care of health and the prevention of disease rather than in operative work or special lines of treatment.

In obstetrics he will not only be proficient in diagnosis, but in the knowledge of the mechanism of normal labor and the physiology and pathology of pregnancy, labor, and the puerperal state. One of the most important diagnoses that he will ever make will be the fact that the fetal head has not engaged after suitable pains in the mother's pelvis. Failure to make this diagnosis has caused more obstetric tragedies than any other one element in obstetric practice. He will recognize the gravity of a sudden, bright hemorrhage from the vagina in a woman pregnant, near term, and his recognition of placenta previa will result in the saving of the lives of mother and child. He will readily detect the fallacy in such a trade imposition as "twilight sleep" and warn his patients against it. His knowledge of normal labor will prevent him from using pituitrin improperly, and he will thus save the lives of many infants.

It may be of interest to ask the results of obstetric surgery in dealing with the more important complications of pregnancy and parturition. I have taken from my records

of personal experience 200 cases all delivered by various forms of abdominal section. Of these 200, 120 were the classic Cæsarian section, whereby the child was delivered and the mother left capable of further procreation. In 47 cases there was sufficient reason for sterilization, but septic infection was not present, and hence hysterectomy was performed and the stump dropped and the abdomen closed without drainage. In 28 cases there was sufficient reason for sterilization, but septic infection was present. The body of the uterus was removed and the stump fastened in the lower end of the abdominal incision with a clamp by Porro's method. In three cases extirpation of the uterus was performed, and in two the patient was moribund and practically a post-mortem Cæsarian was done.

The indications for operation cover essentially the field of obstetric pathology—contracted pelvis, disproportion, toxemia, nephritis, eclampsia, valvular disease of the heart, pelvic tumor, tuberculosis, placenta previa, transverse position with impacted fetus, prolapse of the cord, impacted fetus, septic infection, and rupture of the uterus. Naturally the greater number of cases were those of disproportion or pelvic deformity.

These cases may be divided into those that were clean so far as septic infection was concerned and in good general condition, and those that were unclean or in poor condition. Of the former clean cases there were 140, with one death. In this we found peritonitis, caused by the bacillus proteus vulgaris. We examined bacteriologically samples of catgut, dressings, suture material, and made other tests, but could not find the origin of the infection. This series of favorable cases gives a maternal mortality of .071 per cent.

There were 55 cases complicated by toxemia in its various forms, including eclampsia and nephritis; by pulmonary tuberculosis, pneumonia, placenta previa, heart lesions, and degenerative conditions in the abdominal and thoracic viscera. The mortality among these was 15, and it may be interesting to observe that 22 cases of placenta previa had no maternal death, and that the deaths from puerperal septic infection were but five in number. The greater mortality resulted from toxemia and from degenerative diseases of the thoracic and abdominal viscera, and from the acute pulmonary infections, pneumonia and tuberculosis. Since we have made a rule to treat all septic cases by the Porro method, our deaths from septic infection after delivery by abdominal section have been reduced to a very small percentage. We ascribe these results to the fact that the body of the uterus is removed and that the stump is outside the peritoneal cavity. As an added precaution, I ligate the ovarian and round ligament arteries separately, thus preventing with the firm pressure of the clamp the passage of septic matter from the uterus into the circulation.

You may be interested in the treatment of placenta previa by abdominal section, and of this I am a decided advocate. Since completing this series of 200 cases I have had others, among whom are two cases of placenta previa, thus bringing the total up to 24 without maternal death. Some of these were exsanguinated, suffering from shock, and in a critical condition. We have entirely abandoned the use of the vaginal tampon in placenta previa, but if a considerable portion of the membranes is available through the vagina we may rupture the membranes freely and give tonic doses of strychnia. This will result in good uterine contractions, stop the bleeding by forcing the fetus against the placenta, and ultimately lead to delivery. Unless, however, a considerable portion of the membranes is available, we treat placenta previa by section.

In this series there were three cases of extirpation of the uterus: one at five months for scar tissue in the cervix, separation of the normal placenta, hemorrhage, and infection; one for carcinoma of the cervix complicating pregnancy; and one for pregnancy complicated by ovarian tumor, placenta previa, transverse position of the child, prolapse of a loop of the cord. The pregnancy was an early one. Of these three mothers, two lived and one died.

There were as stated two moribund cases

from toxemia and eclampsia, in whom abdominal section was done to save the child. The total maternal mortality of the series is 7.5 per cent, a result which compares very favorably with the statistics given by large clinics of the mortality of vaginal delivery for the same complications.

In this work we have confined ourselves to the classic Cæsarian section, to hysterectomy, and to the Porro operation. We have not used suprasymphyseal section, extraperitoneal, laparo-elytrotomy, or delivery through peritoneal fistula. Obviously vaginal Cæsarian section is not delivery by abdominal section, and hence no case of that sort is included in this series.

DIAGNOSIS AND TREATMENT OF CHRONIC GONORRHEA.

BY J. W. MILLER, M.D., CINCINNATI.

Many causes tend to prolong a chronic gonorrhea. The extension of the inflammation to the posterior urethra, with consequent infection of the prostate, is the most common cause. An inflammation involving either the prostatic ducts, an involvement of the seminal vesicles, or an epididymitis, is found in nearly all cases of long standing. Under favorable conditions any one of these foci may reinfect the mucous membrane of the posterior urethra, which accounts for the relapsing and obstinate cases we so frequently see. After the second month, when painful symptoms have passed, and free discharge has ceased, the patient is likely to think himself cured—at any rate to return to his old habits as to drink, diet, and excessive exercise. This causes a rekindling of the old process, which in its obscure location has not been thoroughly attacked. The inflammation is now no longer diffuse, but is localized in one or more small circumscribed areas, either anterior or posterior to the cut-off muscle. If anterior the principal inflammatory changes occur in the glands of Littre, especially in the region of the bulb. When a chronic posterior urethritis exists we generally find in addition a prostatic or vesicular involvement, occasionally an epididymitis, rarely a cystitis. The rich glandular tissue of the prostate, especially in the region of the caput gallinaginis, is very prone to chronic inflammatory changes giving rise to desquamative or purulent catarrh.

A chronic gonorrhea is said to begin with the first deposit of connective tissue fibers in the patchy cellular infiltrate of acute gonorrhea. The gross changes may be superficial or deep (subepithelial). Oberlander divides infiltration of chronic gonorrhea into two main groups: (*a*) soft infiltration, (*b*) hard infiltration, according to the stage to which the deposition of connective has advanced. We may then consider every case of chronic gonorrhea a case of stricture. Soft infiltrations do not produce any appreciable narrowing of the urethra, while hard infiltrations are true strictures as we clinically understand the term, and produce a decided narrowing of the urethra.

There is no sharp line to be drawn between the morbid processes observable in the acute and chronic forms of the disease, the one form merging imperceptibly into the other. In the early stage the discharge is usually profuse. As the inflammation becomes localized to one or more spots in the urethra the discharge lessens in amount, and passes from a purulent condition to a thin, clear mucus, just sufficient to stick the lips of the meatus together. The urine is more or less cloudy and seldom fails to show the presence of gonorrhea threads.

CHRONIC ANTERIOR URETHRITIS.

The most noticeable symptom is the well-known bead of purulent secretion which is found at the meatus on waking in the morning. The "drop" forms over night (as the canal usually is not washed with urine for seven or eight hours). The amount of discharge during the day is just sufficient to cause a gluing of the meatus, frequent urin-

ation washing away the greater part that accumulates. Generally the two-glass test shows: urine No. 1 cloudy, No. 2 clear. This appearance of the urine depends largely on the degree of inflammation—if fairly recent, cloudy; if of long standing the urine will be quite clear and free from mucus and pus, but will show threads floating in it. By the clinical history and instrumental examination we determine whether we have to deal with the condition spoken of as soft infiltration. A characteristic feature of these cases is the fact that the lapse of time since the original infection is a very short one, usually only a few months. However, we are not justified in making a diagnosis of the character of the urethral infection before an instrumental examination is made. Narrowing of the urethra is not a prominent part of this form of infiltration. With a bougie à boule, steel or black gum, selecting as large a size as the meatus will admit (performing a meatotomy if necessary), we lubricate the instrument, and gently pass down the whole length of the urethra, noting sensitive spots as the head of the bougie passes over an inflamed area; a twinge of pain is often felt by the patient, which ceases as soon as the head passes beyond the spot, but is felt again as the head passes over it when the instrument is being withdrawn. The practiced hand soon learns to detect even the slightest changes from the normal. This procedure may cause slight bleeding. The passage of the bougie proves the absence of any decided stricture.

To recapitulate, in soft infiltration, or stricture of large caliber, we have, first, a history of gluing of the meatus and lapse of time (usually short) since the original infection; second, character of urine, which may be slightly cloudy, or clear, containing urethral threads; third, examination with bougie shows no decided narrowing, but may elicit roughness, sensitive spots, and cause slight bleeding. If you care to go into the diagnosis more carefully, and determine the degree of contraction, a Kollman urethrometer is an excellent instrument for the purpose. This instrument, when introduced, can be expanded at will, the degree of expansion being indicated by a pointer on the dial. The dilatability of the normal urethra in its various divisions must be borne in mind. Carefully compare the amount of dilatation which the urethra will admit with its normal dilatability, and a very good idea of the extent and depth of the inflammation can be arrived at. As a rule the use of this instrument can be left to those who devote most of their time to urinary diseases. The endoscope is sometimes used, but in the opinion of Casper and other authorities it is of value for diagnostic purposes in a few selected cases only. The writer dissents from this view, and agrees with Wassidlo, that the urethroscope is of great value for diagnosing and treating infections of the urinary tract. A simple and at the same time a valuable method of detecting an involvement of Littre's glands is to pass a large-size steel sound, and feel over the sound the infected glands, which give one the sensation of fine shot deep within the tissue.

CHRONIC POSTERIOR URETHRITIS.

Here as in chronic anterior urethritis the disease is often unnoticed by the patient. Pain or appreciable secretion may be absent, but more often pain, local or reflex in character, will be complained of, and if discharge is not noticeable an examination of the urine will show cloudiness or clap shreds. A history of the case and rectal palpation seeking for prostatic or vesicular involvement is always necessary in endeavoring to make a correct diagnosis. As in chronic anterior inflammation, if the condition be fairly recent, the urine will be cloudy from the presence of mucus or pus, and floating in it will be seen numerous urethral threads. If of long standing "tripper faden" floating in clear urine will be observed. It is best to carefully wash the anterior urethra before collecting urine. Make a microscopial examination of the discharge and threads. We will find shreds to be composed chiefly of pus. Gonococci may or may not be present. Rule out all chronic urethral discharges, as urethror-

rhea, bacteriuria, prostatorrhea, and spermatorrhea. Urethrorrhea follows on overactivity of the urethral glands and often a chronic urethritis due to too much local treatment. Microscopically the discharge is made up of mucus and epithelial cells. Discontinuing local measures and instituting means to tone up the general health will generally correct this condition. Bacteriuria, characterized by a very cloudy urine, sometimes even a slight discharge, microscopically shows swarms of bacilli, usually the colon bacillus. The discharge will often disappear after a few strong antiseptic injections.

Some cases of bacteriuria we meet with are extremely obstinate. In these obstinate cases vaccine therapy has recently been highly praised. Prostatorrhea and spermatorrhea are seen mostly after defecation or urination, and are due to squeezing out the secretion from the prostatic ducts or seminal vesicles during the end of the act of defecation or urination by the intra- and periprostatic muscles. It may also appear during sexual excitement. Microscopically it contains the normal elements from the prostate and seminal vesicles.

To sum up diagnostic points: First, obtain a good history; second, make a careful microscopical examination of the discharge and urine; third, rectal palpation of the prostate and seminal vesicles must never be omitted. One should be familiar with the size and feel of the normal and the pathological prostate. Finger and Frank believe that the prostate is involved in every case of chronic posterior urethritis. The prostatic secretion is obtained by expression, making firm pressure per rectum. A drop will flow directly from the meatus on a slide, which is held in position for the purpose. Examination is made of the fresh specimen, also of a specimen fixed and properly stained.

Seminal vesiculitis is often associated with prostatitis. Symptoms: In chronic posterior urethritis a history of frequent exacerbations is nearly always elicited, or referred symptoms may be complained of. The physiological function of the prostate is a sexual one, and it is common to find sexual disturbances resulting from disease of the gland. Anatomically it is closely related to the bladder and urethra, therefore we can expect bladder and urinary symptoms. A frequent desire to micturate, often associated with pain and burning, during and after the act is a common urinary symptom. The sexual complaints are partial or total loss of power for erections, premature ejaculations, and loss of sexual desire. Referred symptoms of pain are very frequent. Examination of urine will show presence of comma shreds, squeezed out by the intra- and periprostatic muscles. The expressed secretion shows pus cells in excess. After a careful search gonococci may be found.

TREATMENT OF ANTERIOR URETHRITIS.

In recent cases (subacute) merging into a chronic condition our first aim is to subdue the general catarrhal condition. To effect this irrigation is suggested. It is best to select that method which causes the patient the least discomfort. The Janet method, popularized in this country by Valentine and sometimes referred to as the Valentine method, is accomplished by gradually increasing the pressure of the fluid injected at the meatus by means of the irrigator, until it is sufficient to overcome the spasm of the compressor urethræ. An irrigation may be given in the sitting or standing position. It is well for the first few irrigations, on account of fear and tendency of nervous patients to faint, to allow the patient to sit on the edge of a chair, holding a small-size enamel basin, into which is received the washings. A blunt-pointed glass nozzle, from which air has been expelled, is gently introduced into the meatus. Depending on whether we wish to irrigate the anterior or posterior uretha will govern us in regard to the force of the stream. For anterior irrigation, in order not to force cut-off muscle, we regulate our flow accordingly. A slow, sluggish stream is always best to use in the beginning, as a routine, in order not to frighten the patient and also to slowly fill the anterior urethra, until bal-

looning occurs; then remove nozzle, and allow escape of fluid. This technique is also to precede posterior irrigation, in order not to wash back any inflammatory products which may be present. Now, having washed out the anterior urethra thoroughly, and becoming acquainted with capacity of urethra and sensitiveness of the patient, we get a firm grasp on the penis and completely occlude the meatus, and allow from eight to ten ounces of solution to enter the bladder, or just enough to cause a slight desire to urinate, which in some patients may be as little as one or two ounces. You may have some trouble in overcoming the cut-off muscle. This can usually be overcome by instructing the patient to throw the head and shoulders back and to breathe deeply, at the same time telling him to urinate. If the least trouble is experienced, it is necessary to introduce one-half ounce of cocaine hydrochlorate, three-fourths of one-per-cent solution, retaining for five minutes. I never hesitate to use this solution, knowing how easy it is to injure the delicate mucous membrane by trying to force the cut-off muscle.

The drugs used in making solutions for irrigating depend largely upon the case. Potassium permanganate is most useful. It can be introduced as a hot solution, as can also silver nitrate, in strengths varying from 1:10,000 to 1:2000. If we find gonococci present in shreds or prostatic secretion irrigations of protargal (cold) or albargin (hot) are to be preferred. The strength generally employed is one part in one thousand. Oxycyanide of mercury, in the strength of 1:4000, is useful in non-specific urethritis. The patient is irrigated every day in the beginning, later two or three times a week.

Internal treatment is of little value in these conditions. Salol or hexamethylenamine may be given in cases of mixed infection. For circumscribed areas found by the endoscope or palpation with bougie, that refuse to heal by ordinary methods, much can be done by applying an astringent directly to the affected spots. There is no better instrument for this purpose than the urethroscope. Having carefully exposed the inflamed area, a solution of silver nitrate 1 to 10 per cent may be applied by means of an applicator.

Discharge Dependent upon Strictures.—As above mentioned we may have strictures of such wide caliber that they occasion none of the classical characteristic symptoms of stricture, yet unless they are recognized and the proper treatment instituted the condition will never be corrected. Having diagnosed a narrowing of the urethra the rational treatment is gradual dilatation, if permanency of cure in our cases of chronic gonorrhea is to be looked for.

TREATMENT OF POSTERIOR URETHRITIS.

Of great importance from a therapeutic standpoint is that portion of the genito-urinary tract which is most commonly the cause of perpetuation and rekindling of chronic urethral discharges. A chronic posterior urethritis without prostatic or vesicular involvement is comparatively a rare condition. When such cases are met with, however, the best results are obtained by hot irrigations and high dilatation, using a Kollman or Frank dilator, remembering that the value of dilatation of the urethra in assisting in the absorption of an induration has long been recognized. The passage of a sound is usually inadequate. To obtain full benefit in the treatment the dilatation must be carried out on a rational and systematic plan. The dilatation must be very gradual, not more than one millimeter at a sitting, and must be stopped immediately it occasions pain; it should not as a rule give rise to bleeding. After an interval of five or seven days, when all reaction has died down, the dilatation may be carried to a fuller degree. After each dilatation the urethra must be irrigated with a dilute antiseptic solution such as oxycyanide of mercury 1:4000. The pressure and dilatation not only assists absorption of the inflammatory induration, but it squeezes out the contents of the urethral glands, and liberates any gonococci which may be lurking there. The beneficial effect of dilatation

and irrigation is seen in the clearing up of the urine through the disapperance of the cloud of mucus and the diminution in the number and size of threads.

Discharge Dependent upon the Prostatitis.—Should the symptoms point to the prostate being involved, this gland should be gently massaged two or three times a week. The operator's finger is covered with a rubber cot and well anointed with vaselin. A convenient and satisfactory position for the patient is to have him bend over the office table, with his head resting upon his forearm, telling him to relax as much as possible. The finger is then pushed into the rectum. Starting at the external part of the lateral lobe the massaging finger-tip works its way toward the median line of the gland, carried to the external border immediately below the previous path of massage, and again worked toward the center. This is continued until each lateral lobe has been thoroughly gone over. At first the sittings must be very short; later digitization may be prolonged from two to five minutes.

Instillation.—When the urine is quite free from mucus and only shows the presence of urethral threads, a stronger solution may occasionally be applied, preferably lactate of copper. A two-per-cent solution in glycerin introduced by means of an Ultzmann syringe answers admirably. Silver nitrate solutions in the strength of from one to ten per cent are also used. It is my custom when using strong silver solutions to always employ the endoscope. The Valentine straight instrument may be used or, what I prefer, the curved urethroscope of Swinburn. The most marked area of inflammation will often be found in region of the caput. The direct application is a much more scientific procedure; besides, better and quicker results are noted.

Vesiculitis, although an extension of the gonorrheal inflammation to the vesicles, occurs less often than either extension to prostate or epididymis; it certainly complicates these cases more frequently than is commonly supposed. The diagnosis is made by rectal palpation; there is no characteristic symptom of this affection. After you have palpated the upper portion of the prostate, make counter-pressure with the other hand over the pubic region. If there is any enlargement or induration of the seminal vesicles, it will readily be detected by the experienced finger. Stripping the vesicles is indicated if inflammation is present. The diagnosis of epididymitis is so easily made that I will merely mention it as a factor occasionally causing the production or persistence of a chronic urethral discharge.

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THE RELATION OF BLADDER TUMORS TO THE CANCER PROBLEM.

BY ALEXANDER RANDALL, M.A., M.D., PHILADELPHIA.

While thinking over the complexities and results of a case of bladder tumor the following thoughts formulated themselves into a concrete idea. I have attempted to express this idea in what follows, in the order and way of its occurence, so that the weight of it may reach the reader as the idea did me.

From the observations of surgeons it has been demonstrated that the majority of all vesical neoplasms, when first seen, are of the benign papillomatous type—a tumor which microscopically shows no evidence of malignancy.

In 1910 Beer first brought to medical attention the efficacy of the electric spark of a high-frequency coil, and the methods by which it may be used, to cause the destruction (fulguration, desiccation, electro-coagulation) of such benign growths, while the subsequent evidence of the past five years has demonstrated that by these means a cure can be definitely established. A method simple of application.

The past experience of surgeons in operating upon such cases of benign vesical papilloma by removal with the knife has been wofully disappointing, recurrence of

the growth arising in over one-half of the cases, not only at the original seat of the lesion, but frequently almost as though a stimulus had been given, causing the entire vesical cavity to become proliferative of papillary outgrowths. These recurrences absolutely and invariably become in time malignant neoplasms, causing subsequent death; microscopically they are of the carcinomatous type of growth.

The universality of the malignant tendency of the benign vesical papilloma has become so recognized that this tumor is now considered by urological surgeons and pathologists as potentially a malignant growth. Unless early destroyed it can be counted upon to ultimately show malignant characteristics, and cause death. It is likewise claimed that upward of 50 per cent of the vesical carcinomas are due to malignant changes in benign growths.

The length of time of benignancy is not known, nor can it be expected to be constant. Whether all vesical carcinomata are in their infancy benign papillomata or not, likewise is not known; probably a very small percentage are malignant from their incipiency, or are metastatic, but certain it is that the largest percentage are malignant degenerations in originally benign papillomata.

To-day the American medical profession is striving to understand cancer and to reduce its increasing ravages. These three facts relative to bladder tumor stand out in the midst of our accumulated knowledge as being almost axiomatic:

First, the great majority of all vesical tumors are in their incipiency of a benign nature.

Second, high-frequency electricity can remove such growths and has given a high percentage of permanent cures.

Third, the benign vesical papilloma is ultimately and potentially a malignant growth and should be so considered.

Therefore from these truths let it be recognized that in this benign tumor is seen a definite precancerous stage. And in our efforts at cancer eradication let us appreciate that, at least in this type of tumor, an early recognition of the condition will mean its almost complete extermination.

1831 CHESTNUT STREET.

CLINICAL EXPERIENCES WITH COAGULOSE IN CASES OF HEMORRHAGE.

RAIN in the *Southern Practitioner* for December, 1915, says that we are all aware of the fact that the application of a foreign blood, such as might be obtained from an animal or another human being, when applied to an oozing surface, frequently causes a more or less prompt cessation of the bleeding. It is therefore a rational procedure to obtain a serum or a preparation from normal blood that will contain sufficient ferment. Such a preparation is coagulose. This product is a sterile, soluble, anhydrous powder, and contains the fibrin ferment necessary to cause clotting of the blood. It is obtained from normal blood serum and is readily soluble in cold water at concentrations two or three times that of the original serum. It retains its efficiency unimpaired for a great length of time, as 0.65 gramme of desiccated powder, equivalent to 10 Cc. of the blood serum when mixed with 6 to 8 Cc. sterile water, is supplied in 15-Cc. glass bulbs. Rain's experience with coagulose is not confined to cases in which a deficient fibrin ferment was believed to be at fault, but to cases also in which an open ulcer was the cause of the hemorrhage, such as the bleeding in typhoid fever. He reports these cases:

Case 1.—Aged fifty, housewife. Family history negative. Present trouble (severe epistaxis) began about six months ago; a continuous oozing for the past three months. Had been treated by specialist during this time, he stating that he could find no cause for hemorrhage. Relief was only temporary, and after three office consultations the case was referred to Rain. Physical examination proved negative, except for secondary anemia due to loss of blood. Blood-pressure and urine negative. This hemorrhage could not be accounted for in any other way than that her blood lacked in coagulating element.

The treatment consisted in giving one dose of coagulose each day for four days. An appreciable change was seen after the first dose and before the administration of the second dose, the day following, as oozing was diminished in amount, judging from the number of soiled handkerchiefs, as well as the color of them. Each day showed improvement, and on the day of the fourth administration the hemorrhage had entirely ceased. Each dose was administered early in the morning. Four doses in all were administered. The result was most gratifying.

It is now over a year from the time that this case was treated, and there has not been a return of the above symptom. The patient is well and hearty.

Case 2.—Male, aged eighteen, the son of the last-named patient. The family history is negative, except mother had severe epistaxis about eight months ago.

Moderately severe epistaxis of about two weeks' standing. All methods of local treatment to nasal mucous membrane had failed, at least in part. On account of the happy result obtained by his mother, he came to consult Rain about his nose bleeding.

He was given two doses of coagulose on successive days. The bleeding ceased after the first dose.

This case proves interesting because of the age of the patient and because of the mother's history. Neither had ever had nosebleed before. A clear history of hemophilia could not be obtained in the boy. It is interesting to note that these two cases of hemorrhage occurred about the same time, only eight months intervening. It is also interesting to note that ordinary styptics failed; the blood would not coagulate.

Rain says that the happy result in these two cases certainly speaks well for coagulose.

The patient was asked to report if he ever had any bleeding from any membranes again. So far such has not been reported, a period of almost seven months.

Case 3.—Male, aged twenty. Trouble began about one week ago, with headache, temperature 101°, pulse 84. No other symptoms noted at this time. Temperature was watched daily. With morning remissions, temperature gradually reached the height of 105° at the end of one week. At this time the Widal reaction proved positive. Temperature remained at 105° three days, then became 103 4/5°. The patient did well considering severe typhoid toxemia until about second or third day of the third week, when he suddenly began having hemorrhages, fifteen in all, within three days. Case was despaired of, and though he reacted after each hemorrhage, Rain was at a severe loss to state what would be the outcome. Naturally his prognosis was very grave. Blood-pressure had not been taken throughout this case nor at the time of any of the above hemorrhages. At the time the first dose of coagulose was administered the pulse was very rapid and thready, and could not be successfully counted. The patient was extremely restless; the entire surface of the body was bathed with cold sweat. Profound anemia was marked, though no blood was taken for hemoglobin estimation. Lips, mucous membrane, and ears were profoundly cyanotic. Six doses of coagulose were given within two days—four for the first day, and two the second. No other treatment except elevation of the foot of the bed, ice-bag as usual to the abdomen, and saline infusion under the breasts. There was no other evidence of active hemorrhage, as far as he could ascertain. The blood-pressure was taken the following morning, and much to Rain's surprise was found to be 80. The patient had reacted; the temperature had become lower than at any time before, registering 102°, pulse 136, respiration 24. The blood-pressure a week later was 110. The patient recovered.

This case was seen with Rain by various consultants, and they all felt it was hopeless. However, to set at rest the minds of the parents, coagulose was suggested, and was administered as above stated.

The first two hemorrhages of this group were unusually severe. The other was probably less so, as symptoms were not so severe or as marked after the first two hemorrhages.

EDITORIAL.

IMMUNIZED MILK AS A PREVENTIVE AND CURE IN TUBERCULOSIS.

It is not many years since the introduction of tuberculin for the purpose of testing milch cows in order to determine whether their milk was suitable for human use. Now it is universally recognized that no milk should be taken by a human being that does not come from cows which have been subjected to the tuberculin test, and in many States the law requires that all milch cattle shall be tested with tuberculin at regular intervals. At the present time the question which arises is whether we should not go one step further and, by the use of tuberculin in milch cattle, endeavor to produce an artificial immunity to tuberculosis, not only in the cow, but in the person who ingests the milk, the animal transferring her immunizing bodies to the recipient. The hope has been expressed that not only should human beings be, at least in part, immunized against tuberculosis, but that in certain cases of actual tuberculosis the use of such immunized milk might produce curative results. Of course, this brings us face to face with the problem of the difference between bovine and human tuberculosis. It has been pretty well determined that bovine tuberculosis is quite capable of affecting man, but, so far as we are aware, the question naturally arises as to whether the tuberculin used in milch cattle should be obtained from bovine bacilli or human bacilli.

An interesting article dealing with this important matter has been contributed to the *New York Medical Record* of November 27, 1915, by Rosenberg, who is an enthusiastic advocate of the plan of immunization and urges the profession to assist him. He claims, first of all, after taking statistics throughout the world, and especially in the United States, that the death-rate from pulmonary tuberculosis continues unchanged, although there is a decline in a few cities, and that the sickness and mortality of other types of tuberculosis, as, for example, in the glands, bones, and joints, and among children, have increased. As it is not our object to discuss this aspect of tuberculosis we do not quote his statistics. The point that Rosenberg wishes to insist upon is that, while we are doing much for the relief of the tuberculous and something towards the prevention of this disease, we are not protecting individuals from the tuberculosis which comes to man from animals as carefully as we are protecting him from that which comes from man, for it is to be remembered that so-called "certified milk" certifies to the quality of the milk as a food rather than as a bacteria-free substance, and that butter and even cheese sometimes contain tubercle bacilli. Rosenberg goes one step further and claims that while pasteurized milk may be better than ordinary milk it is not sterile and does not guarantee safety against infection.

As is known to many of our readers, Gilliland has apparently succeeded in inducing immunity in cattle against tuberculosis, and others have followed in his footsteps. In other words, we are apparently approaching the time when healthy cattle are to be vaccinated against tuberculosis. Rosenberg states that in experiments carried out under the direction of Dr. William H. Park, than whom no one is more reliable, it was found that inoculation with dead cultures of tubercle bacillus induced the formation of specific antibodies in the blood and milk, and that feeding the milk of cattle possessing such antibodies produced antibodies in turn in the blood of the recipient, although this blood did not contain them before such feeding.

Where it is difficult for individuals to keep cows Rosenberg suggests that immunized goats be kept for private supply, and adds that immunized milk is now being used in a number of tuberculosis institutions with reported good results. If these promises hold true an immense advance in the

war against tuberculosis has been made. The proposition is not at all impossible from the commercial standpoint, since the method of immunization is not difficult and does not add very materially to the cost. The technique of immunization is that of the ordinary use of tuberculin to determine that the animal is free from tuberculosis. This is followed by the injection of B. E. tuberculin, that is, bacillary emulsion. Rosenberg thinks that some immunity may be obtained by three or four subcutaneous injections, but where it is desired that antibodies shall be present in the milk, he advises 15 injections at weekly intervals with increased doses of vaccine, and after this a dose every two or three weeks. He even goes so far as to express the belief that immunized milk combines the effects of protective vaccination in smallpox and of serum therapy for diphtheria. He adds, very wisely, that farms and dairies will supply immunized milk if it is demanded, and that immunized milk will be demanded if physicians recommend and demand it.

CERTAIN POINTS CONCERNING ANESTHESIA.

Although no department of medical literature, unless it be that dealing with cancer and tuberculosis, has a larger literature than that of anesthesia, it would seem that for many years to come it will remain one of the chief topics for discussion on the part of physicians and surgeons. Almost every year brings forward facts which taken together are of the greatest importance, these facts being developed in the laboratory or at the bedside.

The difficulty of accepting at their face value all laboratory reports lies in the fact that different animals respond to anesthetics in different ways; that all of them respond with a difference in degree, if not in kind, from the response made by man; and, finally, that the experimenter in the laboratory uses a healthy animal, whereas, in a large number of cases, in human beings the recipient is not in a state of health. This does not in any way militate against the value of laboratory experiments. It only serves to make us cautious in their too rigid application to man.

One of the most rational experimenters who has done noteworthy work with anesthetics is Embley, who recently has discussed the relationship between ventricular fibrillation and chloroform syncope. Here is an instance in which it is evident that different animals have different susceptibilities, since cats very frequently have ventricular fibrillation when under chloroform, whereas dogs rarely do so. The result of Embley's work upon animals leads him to believe that there is much truth in the view that the period of induction of anesthesia with chloroform is a period of greatest danger. On the other hand, it will be most unwise, as Blumfeld states, to believe that safety is to be found in a deep degree of narcosis. Much safety can be obtained by mental assurance of the patient, a proper posture, the gradual induction of anesthesia, and in the preliminary use of atropine.

We do not think, however, that the general run of American or British practitioners will agree with the views of Crile and Buetler to the effect that "chloroform throughout is the anesthetic of choice for chronic alcoholics in fair condition," or that "oil-ether-colonic anesthesia is indicated for the very obese." It has certainly been the experience of the profession, up to this time, that chronic alcoholics are always bad subjects, and particularly so for chloroform.

Concerning the method of administering ether by rebreathing, we are glad to see that Blumfeld, in an article in the *London Practitioner* for December, 1915, points out that there is always a difficulty of insuring real cleanliness of the bags employed, and also he claims that it is generally admitted that vomiting, intestinal paresis, and pain are less apt to occur after the open method of using ether than when the closed methods are resorted to.

Concerning so-called "twilight sleep" for surgical purposes, Blumfeld quotes Brenzier as emphasizing the importance of using a freshly prepared solution of scopolamine,

and quotes the wise statement of another author that "unless continued observation of the patient in 'twilight sleep' is carried out by some one accustomed to the technique it is better not to employ the method at all." This, we believe, is the view which is at the present time generally accepted; it certainly seems to be the opinion of obstetricians who have used so-called "twilight sleep" sufficiently to be able to speak with authority. The profession in general have been slow to take up "twilight sleep" in obstetrics, and still more cautious in regard to its employment in general surgery.

THE DANGER OF TETANUS IN OPERATIVE CASES.

Tetanus is so rarely met with, except as a result of some accident, that the physician is often misled in his diagnosis in the early stages of the disease, since the law of probability tends to make him exclude this important malady. In two instances with which we are familiar a diagnosis of hysteria was made and adhered to until the disease was so well developed that it could not be mistaken for anything else but tetanus and until the use of antitoxin was necessarily futile. One of these cases developed in an adult male some days after an operation for hemorrhoids, and as the operation had been done by a competent surgeon under the strictest asepsis, the possibility of tetanus infection at the site of the operation was excluded, with disastrous results. The fact that the spores of tetanus can be swallowed with uncooked foods and exist in a harmless state in the alimentary canal, unless they find some solution of continuity in the mucous membrane, is not as generally recognized as it should be. When we stop to think how prevalent tetanus bacilli and their spores are in garden soil, and how many opportunities exist for their entrance into the body when various vegetables are eaten in a raw state, as, for example, cabbage, lettuce, and celery, it is surprising that cases of infection by way of the alimentary canal have so rarely occurred.

In the *Virginia Medical Semi-Monthly* of July 23, 1915, Atkinson reported another case of postoperative tetanus, the patient having been subjected, under careful antiseptic precautions, to an operation for hemorrhoids. The patient did well until the evening of the sixth day, when he complained that his jaws were a little tender, and, on the seventh day, that his neck was uncomfortable, so that it was rubbed and massaged. In the afternoon of the seventh day he had difficulty in opening his mouth. A diagnosis of tetanus was promptly made and antitoxin given hypodermically and intraspinally, so that within thirty-six hours he received 20,000 units. Morphine and chloretone were also used, and recovery eventually occurred. An examination of the catgut which was used in the operation showed that the infection did not occur through its contamination.

Atkinson calls attention to the paper of Matas which was presented to the American Surgical Association in 1909, and which dealt with this important subject under the title of "The Fecal Origin of Some Forms of Postoperative Tetanus," and quotes statistics to show that five per cent of all normal men harbor tetanus bacilli or their spores in an active state in the intestinal canal, and that this percentage is increased to twenty per cent in stablemen, dairymen, and others who are in contact with horses and barn-yards.

SALVARSAN POISONING.

The well-recognized fact in therapeutics that any remedy which is potent for good will, if improperly used, be potent for harm is, perhaps, not as much appreciated as it should be. No drug has yet been discovered which is at once all-powerful along certain lines and innocuous along others, although, of course, some drugs, while capable of exercising many advantageous effects, seem to be incapable of doing much harm. It cannot be expected that remedies which depend fundamentally for their activity upon powerful mineral poisons can be used

with impunity, and this is particularly true of the arsenical compounds and notably of salvarsan. Originally thought to be almost harmless to certain tissues of the body, it has been found that if certain tissues are diseased, particularly those of the cardio-vascular renal apparatus, it is oftentimes a dangerous remedy. It is unfortunate that the reports which are given us concerning the action of drugs nearly always deal with their successes and not with their failures. Much of the literature for the last few years has teemed with the reports of cures effected by "606," and comparatively little literature has been produced recording serious effects which have followed its administration.

An instance of untoward effect produced by salvarsan has recently been reported in the *Journal of the American Medical Association* by Eberly. The patient was aged thirty-six, suffering from lightning pains in his legs, and gave a strongly positive Wassermann reaction. Through an error 0.6 gramme of salvarsan was mixed in 10 Cc. of freshly distilled water. Only a part of the drug was dissolved and none of the solution neutralized. It was injected in the cephalic vein of the right arm. Almost instantly the patient complained of a choking sensation, became extremely pale, with a weak pulse and labored respiration. It is estimated that about one-half of the fluid was injected. An hour later he was found to be markedly prostrated, vomiting, and complained of pain in the region of the left kidney. He remained in this condition for twenty-four hours, voiding no urine, but three ounces obtained by catheter showed a trace of albumin but no casts. On the second day the suppression of urine continued and the patient complained of weakness, chilliness, and general muscular aching. Phlebitis started in the vein which had been injected and extended to the shoulder, the arm being swollen, reddened, and painful. Subsequent to this the arm became more swollen and painful, and the temperature rose to 101° and afterwards to 102½°. Under active treatment urinary secretion was finally reëstablished, but not until after six weeks did the phlebitis subside and the urine become free from albumin.

This case is of interest not so much because it indicates that salvarsan is, under certain conditions of the patient, deleterious, but because it emphasizes the fact that the drug must be very carefully prepared before it is injected, and that any error in the technique of its preparation may result in grave illness or death.

LEAD ACETATE AS A DRUG AND POISON.

Lead acetate has largely fallen into disuse as an internal medicament for the treatment of various forms of diarrhea. During the Civil War a pill composed of a grain of acetate of lead, a grain of opium, and a grain of camphor was administered to sick soldiers indiscriminately for the purpose of controlling the acute, subacute, or chronic diarrheas which were, at that time, an inseparable result of camp life. The profession has gradually come to believe that the vegetable astringents, which depend almost entirely upon their content of tannic acid for their efficiency, have very properly supplanted acetate of lead, and thereby the danger of inducing subacute or chronic lead poisoning is avoided. Some practitioners, however, still employ this salt. A number of interesting points concerning it are brought forward by Charteris in the *Glasgow Medical Journal* for December, 1915.

Charteris points out that the various salts of lead have been not only used largely for the purpose we have described, but also in the treatment of such conditions as hemoptysis, hemorrhage complicating typhoid fever, and in chronic albuminuria and hematuria. It is hard to imagine how they can be expected to do any good in these conditions, since they must be changed by the hydrochloric acid in the gastric contents, or by the intestinal juices, long before they are absorbed, in such a way as to deprive them of any astringent effect. Charteris's paper is not intended to indorse

the use of lead acetate in these various conditions, but rather to point out its possibilities as a slow poison. Thus, in one instance, a man suffering from chronic nephritis with polyuria, albuminuria, and slight hematuria was given lead acetate with the thought that these complicating symptoms might be relieved. The dose was two grains of lead acetate three times a day, and this was continued for eighteen days, making in all 108 grains. Three days later the patient began to suffer from well-marked symptoms of lead poisoning, consisting in severe colicky pains in the abdomen, foul breath, and a blue line on the gums. There was no wrist-drop, no marked anemia, but the colic and constipation persisted for about eleven days.

It is interesting to note that in studying these cases Charteris found that by far the earliest symptom of lead action was the presence of stippling of the red cells—that is, basophilic staining. This stippling could not be differentiated from that which is met with in pernicious anemia and leukemia.

Other interesting observations were made as to the rapidity with which the blue line on the gum may develop. Thus, Charteris speaks of a case that showed the blue line after the patient had received only four lead and opium pills. Another one showed it after taking three grains of lead acetate for nine days. Two patients showed it in twelve days after taking thirty-six grains of lead acetate, but in other cases the blue line appeared much more slowly, even when doses of the same size were employed. Thus, in one instance, it appeared after forty-two grains had been taken, and in another after sixty grains, and in still another not until 128 grains had been ingested. He quotes Burton as speaking of a case that developed a blue line at the end of four days after receiving a total of fifteen grains. Another developed it in four days after using twenty-four grains, whereas still another took ninety-six grains in eleven days without showing the line. Other cases of a similar nature are also quoted.

So far as the effect of the acetate of lead upon albuminuria and hematuria are concerned they may be considered *nil,* as in some instances these symptoms actually increased or were not modified in the slightest degree.

Charteris further concludes that lead acetate is obviously not a drug which can be indiscriminately recommended in chronic hematuria and albuminuria, since even in medicinal doses there is a risk that plumbism may be produced, and, therefore, the drug ought not to be given for longer than two weeks in two-grain doses thrice daily.

TREATMENT OF ABDOMINAL WOUNDS IN WAR.

One of the burning questions of the day to the military surgeon is the one bearing upon the question of prompt operation in cases of abdominal bullet and shell injury.

Wallace (*Journal of the Royal Army Medical Corps,* December, 1915) notes that abdominal wounds form only a small proportion of the injuries met with in war. In nine field ambulances over a period of six months the percentage of abdominal wounds was a little under two. During the same period in seven casualty clearing stations it was 0.72. The mortality of the same field ambulances was 30.33, and in the same casualty stations 56.49. These figures apply to the period when abdominal cases were retained in dugouts, field ambulances, or casualty stations, and treated by starvation, morphia, rectal saline, and rest. Some attempt was made at the casualty stations to treat by operation those cases which arrived in sufficiently good condition, but the results were so bad that operations were for the most part given up. Bullet wounds of the small intestine seemed to produce their maximum destructiveness, but in the colon and stomach they at times produce complete or nearly complete division of the viscus. Shell fragments produce extensive injuries, but hardly worse, if at all worse, than bullets. The bomb fragments, though small, have an immense velocity and therefore great penetration. An insignificant wound of the skin may lead down to a series of intestinal perforations. Thus the whole

abdomen may be spluttered over with such wounds; the only way to make sure is to open the abdomen. As many as eighteen perforations in the small gut have been seen.

The least severe abdominal wound is an anteroposterior one in the epigastrium, and the most dangerous are side-to-side wounds below the umbilicus, anteroposterior wounds in the hypogastrium, and wounds in the pelvis inflicted by projectiles that enter the buttocks or thighs. On the whole, projectiles entering from the back are more fatal than those going in the opposite direction.

As to the determination of the peritoneal involvement the track of the bullet is significant, though not always determining. The rigidity of the belly wall and rise in the pulse are the principal guides. These signs are usually present within four to five hours. The main causes of death are shock, hemorrhage, peritonitis, and septic infection of the retroperitoneal tissue

It is hemorrhage which is so prejudicial to patients with wounded intestine, and which causes death after a mechanically perfect intestinal suture. Hemorrhage from the mesentery can be stopped, but the bleeding into the retroperitoneal tissue is often beyond help, as no bleeding point can be found. It is also especially prone to infection. There is usually but little escape of intestinal contents in the case of the small intestine; although the wounds be large the gut is apparently paralyzed. In large gut wounds there may be considerable fecal outpouring. The old belief in the spontaneous cure of gut wound is fallacious and dangerous. The stomach is the only hollow viscus in which spontaneous recovery may take place.

Wallace believes that all stomach wounds should be sutured; that wounds involving the small intestine should be closed by suture unless this involves too great a narrowing; in some cases resection and end-to-end suture are indicated. As much as 9 feet have been successfully resected. As far as the colon is concerned intraperitoneal wounds may be sutured, but if the rents are large a colostomy, especially in the vertical colons and flexures, is the safest course. Retroperitoneal wounds are best treated by the establishment of an artificial anus, a free opening being left at the sides to drain the infected areolar tissue.

The early operative treatment of abdominal cases has been practiced too short a time for the production of accurate figures, but it can be said that suture and a transverse colostomy is possibly the best course.

The mortality in six casualty clearing stations from July 1 to September 25 of 1915 was 48.77. This shows an improvement on the mortality of 56.49 quoted above.

THE OPERATIVE TREATMENT OF VARICOSE VEINS AND ULCERS.

Since the great abdominal veins to which the blood is delivered from below have no valves, there is a column of blood in these vessels unsupported save by the valves of the veins in the legs, a column drawn upward feebly by rhythmic alterations in intrathoracic pressure, but offering a considerable weight against which the blood from the extremities must rise, subject to the changes of abdominal tension, and often a menace to the integrity of the valves below it. To meet this strain, Homans (*Surgery, Gynecology and Obstetrics,* February, 1916) divides the veins of the legs into two systems: the deep, among the muscles and well supported by them, and the superficial, lying in the subcutaneous tissues, and supported only by skin, superficial fascia, and fat. Of these two systems the former is considerably the more capacious and obviously the less liable to disability, while the latter, though it probably carries much less blood, is more exposed to trauma and derives far less support from the tissues outside its own vein walls. The two communicate by what are called perforating or communicating vessels, in which the valves are so set that blood can normally flow only from the surface veins to the deep ones. These perforating vessels, which vary considerably in number and distribution, offer, therefore, a safety-valve for the superficial system.

The surface veins may again be divided into two subsystems, the great or internal saphenous, and the lesser or external saphenous. The great saphenous vein, after gathering radicals from the front and inner side of the foot and lower leg, passes upward, generally as a straight single trunk, inside the knee, along the inner anterior surface of the thigh, and into the femoral vein at the saphenous opening. The small or external saphenous vein drains the back and outside of the foot and leg, and empties in the popliteal space into the popliteal vein. It frequently communicates with its more important companion and, like it, is subject to considerable variation.

All the veins of the extremity are furnished with filmy, delicate, bicuspid valves. At infancy there are, between the foot and the groin, as many as fifteen to thirty sets in both great saphenous veins, but this number undoubtedly decreases even under normal conditions with advancing years. There is almost invariably a valve in the principal vessel just distal to each entering branch and one near the mouth of the entering vein as well. The valves of the deep and surface systems differ in no way from each other, and there is more often than not a valve in the femoral vein just above the point of entrance of the great saphenous. The arrangement of valves in the perforating veins, as has already been stated, allows of bloodflow toward the deep vessels only.

The principal physiologic features, then, of the venous circulation in the legs are the following: The veins pass the blood upward through a series of chambers separated by bicuspid valves set to permit only an upward flow; this flow is favored by movements of the leg muscles assisted by the forces in the thorax which tend to empty the vena cava, and by the push of the capillary circulation; the walls of the veins must support a column of blood whose height is measured by the distance to the heart above, and inasmuch as the abdominal veins are valveless, the pressure upon the upper valve, or upon the vessel walls below it if this valve becomes incompetent, may be enormously heightened by increase in intra-abdominal tension; the deep veins of the legs have a strong muscular support outside their own walls, while the surface veins derive an adventitious support only from the superficial fat and skin; a system of vessels perforating the deep fascia communicates between the two, and owing to the arrangement of its valves, lightens to some extent the work of the latter.

For all practical purposes a varicose vein in the lower extremities may be described as merely a valveless vein, or more properly a vein whose valves are incompetent. Having in mind this fact, one may obtain from a study of the circumstances under which varicosity becomes established and a knowledge of the pathologic changes which necessarily ensue, an explanation of the various forms which varix assumes and a rational basis for treatment.

The most obvious cause of the breaking down of the valves is hard work, by which the author means carrying or lifting heavy loads for long periods, as in the case of longshoremen, freight handlers, and laborers. The tension upon the abdominal muscles, the downward push of the diaphragm in violent breathing—in fact, the same strain which produces hernia—lays a heavy load upon the veins of the legs. Whether the valves become useless through stretching of the vein walls or are directly broken is immaterial. The occupations which involve standing for long periods without moving the legs are, in a less degree, a source of valvular incompetence, and this not from excessive back pressure but from stasis due to lack of muscular movement. Among women the venous engorgement of the legs so often seen even early in pregnancy may finally, after the birth of several children, result in varicosity. The author has also seen in young men, and in young women who have never borne children, instances of varix which date from childhood, apparently due to congenital abnormalities. All these etiologic factors tend to produce the well-known large, surface varicosities.

A second and smaller group of cases arises from phlebitis. The "milk-leg" after

labor, the phlebitis of typhoid and of post-operative convalescence, all give rise to varix which can generally be distinguished from that due primarily to engorgement.

Varix may assume one of two principal forms, depending in a general way upon whether it results from overstrain and stretching of the vein walls, or from phlebitis. In the first case the valves gradually become functionless, the vessel walls stretch until their nutrition is impaired, muscle-cells become replaced by inelastic scar-tissue, the vein becomes tortuous, local areas distend into pockets, calcification sets in, and, indeed, all the variations commonly observed in scar-tissue, ill-nourished and under tension, are likely to occur. As the onset of these changes is naturally gradual, effective collateral circulation corresponding to the degree of stasis in the main channels is frequently established, and true varicosity is often confined to the trunk and principal branches of the great saphenous vein.

The ulcers which occur under these circumstances are almost without exception in direct relation to the varicose vessel or vessels. They are said to "ride" upon veins, occurring almost exclusively in the lower and middle thirds of the lower leg. Fundamentally their occurrence seems to be due to a chronic irritation of the skin associated with stasis of impure blood in the vein beneath, as attested by the pigmentation which so commonly precedes them, but a frequent contributory cause is undoubtedly trauma, and the form which they ultimately assume must depend greatly upon the degree of infection which follows their establishment.

The perforating vessels do not usually share in the varicosity of the large tortuous veins. In many instances they continue for years to fill their rôle of safety-valves, carrying the stagnant blood from the surface veins into the deep system, which is well able to care for it. When, however, they in turn become dilated, the surface circulation becomes the more embarrassed in that blood may now pour out from the deep veins to the superficial. Under the circumstances ulcers are particularly prone to occur, and that over areas independent of the veins themselves.

The first and more common variety of varicose vein is, then, dilated, sclerotic, tortuous; often sacculated and calcified. It is not necessarily associated with very noticeable changes in the nutrition of the leg, owing to the effectiveness of collateral circulation and the preservation of the useful perforating veins. Ulcers when present usually "ride" upon the principal varicose trunk. In the more advanced cases, particularly when the perforating veins have become incompetent, the general nutrition of the leg may be poor, and ulcers may develop over wide areas.

The second and less common variety of varicose vein arises from phlebitis. In this case the valves are suddenly and universally crippled, possibly by the organization of the thrombus, the vein walls are thickened and the lumen narrowed. The circulation through such a vessel is just as ineffective as through a large dilated channel. Ulcers often appear within a few weeks or months of the phlebitis. The great saphenous vein is almost invariably small, hard, straight, and thick-walled, but there are occasionally seen groups of very thin-walled surface branches, as if a collateral circulation had been rapidly established and distended. The perforating veins are nearly always incompetent. The disturbance of the surface circulation is so profound that ulcers are often multiple and widely scattered over the lower leg. The skin and subcutaneous tissues over the whole calf and shin may become a mass of edematous scar-tissue. The foot, however, rarely shares this appearance. Apparently it is well cared for by the deep vessels, perhaps aided by the support of the shoe.

The methods by which the true nature of varicose veins was first effectively demonstrated were devised by Trendelenburg, who showed that in varix there is nothing to prevent a back flow of blood in the veins, and actually measured the pressure which the long column of blood exerted against the vessel walls in the leg. The tests devised by Trendelenburg are easily per-

formed. The leg is raised and held above the level of the heart until the veins are empty. It is then rapidly lowered, when the blood can be seen to flow back into the leg and suddenly distend the surface vessels. This test for varicosity may be positive even when the reflux cannot be seen to distend the vein walls, for if the veins are so sclerosed that no change in the tension of their walls can be noted by the eye, it can quite readily be felt by the fingers.

By such means valvular incompetence of the surface veins as opposed to hypertrophy or distention of normal vessels can be diagnosed, but still more information may be derived from a variation of the same simple procedure. Suppose it has already been determined that the surface veins allow a free back flow. The leg is now raised and the veins emptied of blood. If, before it is lowered, a constriction only firm enough to compress the surface vessels, as by a piece of bandage, is made about the upper thigh, blood cannot flow from above into the varicose superficial veins, and until they are filled by the natural circulation they remain empty.

This French writers have called the *contre-epreuve* of the Trendelenburg test, and it confirms the diagnosis, for on releasing the constriction the empty or partially filled veins become distended with a palpable shock. But this procedure tells even more. Suppose the perforating veins share the varicosity of the surface vessels. The blood in the deep veins will then be able, as normally it cannot do, to leak into the surface vessels, and in applying the constriction test it will be found that in spite of the prevention of back flow down the superficial veins, these fill rapidly below the constriction. That is to say, blood is finding its way out from the unobstructed deep veins through incompetent perforating vessels to the surface. In varicosity of the surface veins alone, filling below the constriction takes place in three-quarters of a minute or more, and even then these vessels may not be very tense, for the perforating veins are continually carrying off the excess of blood. If, on the other hand, the perforating veins are incompetent, the surface vessels will fill below the constriction, possibly in ten, twenty, or thirty seconds, according to the importance of the leak.

Relatively simple surgical measures may be employed to cure pure surface varices, and the least radical of these is the so-called Trendelenburg operation. The original operation was a simple ligation of the great saphenous vein in the thigh and was intended to relieve the veins below the ligature of back pressure due to the long column of stagnant blood. It has been modified into the excision of a short piece of vein between ligatures in order to prevent the reëstablishment of a channel, and this excision is performed as close as possible to the saphenous opening.

The operation should only be performed upon the aged or infirm, or perhaps to tide a young person over a difficult period, or, indeed, merely to heal an ulcer temporarily. An analysis of the results of this operation in the hands of various surgeons shows an anatomical recurrence after five years in 60 to 70 per cent of the cases, but with symptomatic recurrence in only 20 to 30 per cent (Miller).

The radical operation, and one to be advised for the cure of the common surface varix without the involvement of the perforating vessels, is Madelung's full excision of the great saphenous vein. The exact method of performing this operation is less to be considered than a general scheme which will satisfy the following requisites: first, that the great saphenous vein (and the lesser if involved) should be eradicated in such a way that there is no possibility of the reformation of its channel or the formation of a similar channel; second, that the ulcer or ulcers if present be permanently healed; third, that the wound or wounds should heal soundly and not interfere with the nutrition of the skin.

A transverse incision several inches long is made in the groin about an inch below Poupart's ligament. Through this incision the great saphenous vein is divided at the saphenous opening. At the same time any other veins which parallel it or enter from

above are found and divided in order to do away with any vessels capable of reëstablishing a large, single, collateral trunk. The long saphenous is then dissected out with the Mayo stripper or other appropriate means down to the region just below the knee. At this point open dissection should begin, for here the larger branches of the great vein begin to enter it, and though breaking the long column of blood by removal of the internal saphenous from groin to knee is likely in many instances to cure, it is always advisable carefully to dissect out the varicose vessels of the calf down to the point where they appear small and harmless.

The fulfilling of the second requisite, the cure of the ulcer, depends for its success principally on the accomplishment of the first—that is, the complete removal of the veins. It is often advisable, however, in removing the largest veins to take with them what may be called their tributary ulcers. Moreover, as was first pointed out in this country by the Mayos, if in association with the ulcers there has been found a very thick impenetrable base of scar-tissue, it is almost always necessary, in order to secure healing of the ulcers, to remove them down to, or better through, the deep fascia with the mass of scar-tissue beneath and about them; otherwise the poorly nourished tissue may harbor a leaking perforating vessel not disclosed by the tests and may never permanently heal. In consequence of laying bare this oftentimes enormous area, an immediate skin graft (Thiersch preferably) completely covering the denuded surface should be performed, and it is notable that such grafts "take" well upon fat, fascia, or even periosteum.

Finally, in securing the third requisite, the adequate nourishment of the skin and the proper healing of the wound after the dissection required by these procedures, perfect asepsis, perfect hemostasis, and delicate handling of tissues are of the first importance.

Straight, small, thick-walled veins of the post-phlebitic type are almost unnoticeable, yet the lesions which habitually mark their presence—ulcers, edema, atrophy of the skin—are obstinately resistant to treatment; the less noticeable the veins, the more malignant and resistant are the accompanying ulcers, and the more radical and thorough must be the curative operation.

In surface varix complicated by varicosity of the perforating veins, not only must the great saphenous be eradicated, but many of its branches in the calf must be followed and excised in the search for incompetent perforating channels. If these channels are not ligated they will continue to remain a source of venous stasis, and inasmuch as they are frequently found beneath ulcers in the center of great masses of scar-tissue, their removal is generally as difficult as it is imperative.

All such operations require the usual transverse incision below Poupart's ligament and resection of the great saphenous vein in the thigh. When the lower leg is not so densely indurated as to forbid free dissection of the calf, large, thick flaps should be turned back after the method of Madelung to expose the deep fascia of the front and inner side of the leg. The surface veins are dissected from the internal surface of the flaps, and in this dissection the varicose perforating vessels are likely to be found (the author has never recognized in the calf more than three, seldom more than two). They are tied beneath the deep fascia. When an area of scar-tissue is encountered, whether or not it is the seat of ulcer, the judgment of the operator must determine the thoroughness with which this tissue shall be dissected. If an ulcer is present, the whole mass of scar-tissue is best excised and its base skin-grafted. If ulcers have formerly existed and healed, a linear cut may be made through the indurated region and flaps turned back as usual. In this case the wound should be very loosely approximated.

In some instances, however, the whole leg below the knee is so edematous, indurated, and covered with ulcers that not only is the resection of the principal surface vessels a difficult matter, but the turning back of skin flaps for thorough dissection is impossible. It is under these conditions that the spiral cut of Rindfleisch is perhaps indicated.

After operation the ankle and knee should

be immobilized by a crinoline bandage with or without a ham splint. Immobilization need not be maintained longer than a week, but a firm bandage should be applied to the calf, especially when the patient is very obese, for two weeks in all. At the end of this time, if the incisions are well healed the leg should be exercised in bed and the patient may begin to get up. Upon beginning to walk a supporting bandage from toes to knee should be worn for several weeks. After this time all bandages should be discarded, for they may, if tightly applied, be actually harmful.

Skillern (*Annals of Surgery,* February, 1916) writes instructively upon the more conservative treatment of leg ulcers, basing his method upon the pathology and the application of the principles of protective drainage and support. Rubber tissue he regards as the best protective, cut in strips and applied over the ulcerating surface. Drainage is best secured by plain dry sterile gauze, while support is maintained by a roller bandage of muslin, this being applied to the leg in the form of a long figure-of-eight. Strapping is given high praise, although the author does not mention the particular form of straps he prefers. The routine treatment of the average varicose vein and leg ulcer by Unna's zinc oxide and gelatin paste enmeshed in a gauze bandage so as to form a stocking with the consistency of rubber is given first place. On the return visit the bandage is fenestrated at the seat of ulcer. To prevent peripheral pressure radiating incisions may be made through the bandage. Unless it becomes loose or very much soiled the Unna stocking need not be changed for two or three weeks. After varicose leg ulcers have been cured, it is important immediately to institute prophylactic methods against recurrence; and for this purpose a well-fitting silk-elastic stocking or a Randolph bandage should be advised.

Obvious leg varicosities are exceedingly common; it is exceptional that they become crippling factors. When they do they and their complications are usually amenable to conservative treatment, which is best accomplished by support, an Unna stocking being an easy and efficient way of accomplishing this. A patient who is not benefited by skilfully supplied support is not likely to be helped by operation.

REPORTS ON THERAPEUTIC PROGRESS.

PITUITARY EXTRACT: A NOTE OF WARNING REGARDING ITS USE.

In the *New York Medical Journal* of October 30, 1915, BANDLER says it is timely that a warning should be issued concerning the misuse of pituitary extract. Several cases of rupture of the uterus have been reported at medical society meetings; reports of others have come to the writer's ears, although none directly under his notice. Hence he believes it is wise to give a word of advice concerning this valuable drug.

Nothing has been introduced into obstetrics in his time to approach the value of pituitary extract, if used in the proper manner and in proper doses. Pituitary extract increases the contractile power of the uterus. It is evanescent in its effect, the influence lasting, in proper doses, about half an hour.

The writer never uses more than a third of an ampoule at the first hypodermic injection, occasionally, when necessity demands, going as high as one-half an ampoule. This is one of the important factors to be borne in mind; otherwise, we get an extremely powerful contraction of the uterus which may do no harm, provided that all conditions are normal, but which may be productive of harm, and which certainly is bound to be dangerous if conditions are abnormal.

Inasmuch as we have in pituitary extract a drug which increases the contractile force of the uterus, it is clearly apparent that, if the uterus contracts upon a body within it which will not advance and cannot advance because of malposition, or a malproportion

between it and the pelvic bones, if it contracts powerfully enough, it is bound to be injured, and a rupture may take place.

In some instances it has been reported that rupture was so complete that the cervix was almost completely amputated from the fundus. Now, some men may make the error of attempting to put on forceps when the head is above the pelvic brim, not engaged, not molded, etc. A skilful man may do this, a very skilful man, to test the possibility of molding, but in general this is a most unwise procedure. If attempted by men who do not realize the indication for forceps, the worst that may happen is that no progress is made and the fetus is destroyed. Then a specialist or consultant is called in to extract the fetus by version, craniotomy, or otherwise.

With pituitrin it is different. A man may not recognize that the presentation is abnormal; that the head is not firmly engaged, fixed, and molded in the pelvic brim; he may make no examination, and thinking that pituitary extract is a cure-all, a drug that brings the fetus out within a relatively short time, without knowledge of the position and the presentation, he uses pituitary extract. Some men are so deficient in tactile sense that they do not recognize even gross malproportions or transverse presentations.

Needless to say, if pituitrin is used even in small doses, harm may result, but if used in what is considered the average dose by many practitioners, serious injury is bound to result, and it is no wonder that we hear at the present time of rupture of the uterus.

The logical view is as follows, and the writer's experience has shown him that these are essential preliminaries. First, we may deal with a primigravida, where the head is firmly fixed, molded, and engaged in and through the pelvic brim. This assures us of a proper proportion and relationship between the vertex and the pelvic bones, and we know that with or without forceps, with or without pituitrin, this baby can be born through the normal channel, and ought to be born, barring unusual accident, alive.

In a case of this sort, if the progress of labor is slow, whether in the first stage, or particularly in the second stage, it is the duty of the physician in charge to decide what to do. He may give the patient a hypodermic injection of morphine and atropine, and allow her to rest a while, expecting the uterus then to make more powerful contractions and deliver the fetus; or after trying this method, or without it, he may apply forceps; or he may do what the writer has done for the past three and a half years —*i.e.*, in cases in which, in spite of normal conditions, the uterus is not propelling the fetus rapidly enough, use pituitary extract in one-third of an ampoule doses.

The writer can say that since he adopted this method in this class of cases, he has not been compelled in a single one of his private patients to use the forceps. The effect of the extract is very transitory, lasting only half an hour. In some few cases it seems to start the pains so that they go on rhythmically from that time on, and only an occasional additional hypodermic injection is necessary.

In other instances the effect wears off, and the dose must be repeated every half-hour. The writer has given eight, ten, and even twenty such injections, and often more in a large number of cases (and thus have avoided the use of forceps), without injury to mother or fetus.

In fact, he fails to see how this method, if adopted and carefully followed, can result in harm, because—and this he wishes to repeat with emphasis—the drug used in this manner, and with the indications properly understood, only develops a more progressive labor of the same type as is found in the average normal case, *i.e.*, one which runs along to delivery within seven, eight, or ten hours without any delay in the first, second, or third stage.

PITUITRIN IN THE TROPICS.

The *New York Medical Journal* of October 30, 1915, recalls to our attention the fact that Johnson, in an original communication to the *Dublin Journal of Medical Science* for October, 1915, discusses pituitrin and its action on women in the tropics. He

summarizes his conclusions somewhat as follows:

(1) The child must lie in the long axis of the uterus and present preferably by the head. (2) There must be no pelvic contraction beyond a very slight amount, and no obstruction of any kind to labor. Rectum and bladder must be empty. (3) The os must be soft and easily dilatable. (4) The dose should be 1 Cc., not more, except in cases of inertia of multiparæ. It should not be given more frequently than once an hour, and never more than 5 Cc. in any one case. (5) Injection into the buttocks is the best way of introducing the drug. (6) The best time to get the full effect is at the end of the first stage and with the membranes ruptured. (7) The drug has no more effect at full term than at any other period of pregnancy. (8) It is well to give a routine dose of 1 Cc. in every case that fulfils the conditions necessary for the use of the drug because of the great help it affords in causing detachment of the placenta. (9) The perineum must be especially guarded, as the pains caused by the pituitrin are of great expulsive force. Chloroform diminishes the intensity of the pains, and if pushed causes their disappearance. (10) The milk-increasing power of pituitrin and its use as a peristaltic and diuretic, alleged by some authorities, do not seem to apply to Europeans in the tropics. (11) Large doses frequently repeated seem to have a slight toxic effect on mother and child.

Where it was possible Dr. Johnson always instructed his patients to have a hot sitz bath every evening for about a quarter of an hour for the last three months of pregnancy, then to use pure olive oil as an inunction for the perineum and surroundings. He removed all meat from the diet for the last four months. These details, with the usual care for general hygiene, seemed to aid pituitrin in its effect.

Dr. Johnson urges care in the selection of a preparation of pituitary gland. He had what he calls "startling" results from one well-known proprietary preparation, while another—American—gave him uniformly good results in 100 cases.

THE PATHOLOGICAL ACTION OF ARSENICALS ON THE ADRENALS.

In the *Journal of Experimental Medicine* of November 1, 1915, BROWN and PEARCE reach these results:

1. Toxic doses of all arsenicals of which we have any knowledge produce definite pathological changes in the adrenals of guinea-pigs. These changes include congestion, hemorrhage, disturbances in the lipoid content, cellular degenerations and necroses, and reduction in the chromaffin content.

2. The character and severity of the injury produced by different arsenicals vary with the chemical constitution of the compounds.

3. From these facts, Brown and Pearce believe that adrenal injury is an important factor in arsenical intoxication and suggest that therapeutic doses of some arsenicals may produce adrenal stimulation.

THE EARLY RECOGNITION AND TREATMENT OF THE COMMON AFFECTIONS OF THE EYE.

The *Philadelphia Medical Weekly Roster* of December 4, 1915, contains the views of S. D. RISLEY. He says that one of the most common, serious, and fateful pitfalls for the feet of the inexperienced is the group of ocular affections which culminate in increased tension of the eyeball. Fateful, because if neglected or improperly treated they lead to the hopeless destruction of function. Glaucoma is not an entity but a symptom, or the culmination of a symptom-complex. It occurs during or after middle life in patients with impaired health of the nutritional and toxic or infection types. The uveal tract of the eye is very prone to participate in these general maladies in the form of choroiditis, inflammation of the ciliary body and the iris. The excretion of the intraocular fluids is retarded or prevented, the contents of the globe increase, and the eye becomes hard, red from injection, the cornea hazy or steamy and insensitive, the pupils dilated. There is pain, often extremely violent, in the eye and head, one or both; the vision is impaired; the field of

vision contracted. The attack may be transient, but is sure to recur. The danger is that this striking symptom-complex may be mistaken, because of the redness, increased flow of tears, dread of light, and the apparently sudden onset, for infectious disease of the conjunctiva and treated accordingly; or, because of the pain, redness, and impaired vision, for iritis and treated vigorously with atropia, which always does harm in increased tension, or may precipitate an attack of acute inflammatory glaucoma when such a culmination is imminent; or in relatively mild cases, that is to say in subacute or in non-inflammatory glaucoma, the pain produced by the increased tension may be referred to the temples, brow, or occipital region and the case diagnosed as a neuralgia, the eye conditions being overlooked or regarded as secondary. In case of doubt as to the correctness of diagnosis, Risley knows of no other form of eye disease in which the interest of both physician and patient suggests more strenuously the wisdom of consultation with some trusted and experienced colleague than in glaucoma imminens.

ADMINISTRATION OF EMETINE DURING PREGNANCY AND MENSTRUATION.

The *New York Journal* of December 4, 1915, quotes A. J. Chalmers and D. Papatheodorou, in the *Journal of Tropical Medicine and Hygiene,* as reporting their clinical experience in relation to the possibility of treating amebic dysentery in pregnant and menstruating women with emetine hydrochloride, in view of its known utero-tonic effect. The conclusion reached was that a half-grain (0.03 gramme) daily dose of emetine is the maximum which can be given safely in pregnancy. Even the effect of these doses should be carefully watched and no more of the drug injected than is required to kill amebas in the stools, all question of a complete cure being set aside until after delivery. It appears advisable to the authors, likewise, not to administer emetine during the menstrual period, though if it is urgently required, it can be given without causing serious harm, and continued in the intermenstrual period. In one of the authors' cases menstruation appeared during daily administration of half-grain doses of emetine, but suddenly ceased on the second day, and did not reappear, though the injections were stopped. Subsequent periods, in the absence of the drug, proving quite normal, the previous menstrual arrest is ascribed to the simultaneous use of the remedy.

TREATMENT OF OPIUM OR MORPHINE ADDICTION.

RUCKER in the *Medical Record* of October 30, 1915, gives the following statement as to his treatment of the opium habit:

When a patient presents himself for treatment a conference is had with him to ascertain something of his character, motives, and the amount of drug used. He is examined physically, and a laboratory examination of the blood and urine is made. If he is using 2 grains or less of morphine per day, and his condition is good, he is given purgatives for two or three successive nights and an electric light bath every day, and is put to sleep the third or fourth day after he enters for treatment. If a large amount of morphine has been taken for years the preliminary treatment is extended to one or two weeks, according to the condition and needs of the patient. He is given a purgative of 5 to 10 grains calomel and soda and two or three pills containing aloin, strychnine, and belladonna, at about 8 P.M. every other night, the electric light bath being given every other day. The drug is also reduced every other day. If the daily dose has been 10 or 15 grains of morphine, he is reduced to 6 or 7 grains in the first cut; then, say, 1-grain reduction until about 2 grains are reached.

Then the special treatment may be given, which is carefully carried out as follows: On the afternoon preceding the special treatment, 10 grains calomel and soda, 10 grains compound jalap powder, and two or three pills containing aloin, strychnine, and belladonna are given at 5 P.M. The last dose of morphine is given not later than 6 P.M. the same day. No supper is given. At

8 P.M. Rucker gives 15 grains calomel and soda, 10 grains compound jalap powder, and three of the aloin, strychnine, and belladonna pills. The patient is left alone until 6 A.M. the next day (first day of special treatment), when Epsom salt or some active effervescing saline is given in a tumbler of water. The patient is given a warm tub bath about 6.30 A.M., and put to bed in a different room from the one previously occupied. The room vacated and all the clothes of the patient are carefully searched some time during the day for any drug he may have secreted. At 7 A.M. a dose of 30 to 35 grains of trional is given, followed by a glass of hot sweet milk. At 10 A.M. to 2 P.M. the same size dose of trional is given, if the patient is awake, followed by the hot sweet milk. If the patient is asleep when the times come for the second and third doses of trional, we should wait until he awakens, then repeat the trional powder.

The patient is kept in bed, shades down and room darkened, and a special nurse assigned to care for him and give treatment for two or three days, or longer if necessary. The nurse is instructed to keep things quiet in the room, to give the patient water or milk when he is wide-awake, and to feel his pulse occasionally. No one is allowed to see him during the special treatment except the doctor and nurse.

At 6 A.M. the second day a 90-grain dose of sodium bromide is given in a tumbler of water. At 10 A.M. and 2 P.M. another dose of 60 to 90 grains of sodium bromide is given in a tumbler of water if the patient is awake. The patient is kept in bed the second day, and the room is kept darkened and quiet. The physician should go in to see how patient is doing at least twice a day.

At 8 P.M. the second night 5 grains of calomel and soda and two or three aloin, strychnine, and belladonna pills are given, with 7 or 8 grains of veronal.

At 6 A.M. the third day of treatment is begun with a saline in a tumbler of water. A tonic prescription of fluid extract cimicifuga 6 drachms, avena sativa 9 drachms, and aromatic elixir enough to make 3 ounces, one teaspoonful in water at 7 and 10 A.M., and 2 and 5 P.M. Rucker also gives hypodermically strychnine nitrate 1/30 grain, and atropine sulphate 1/100 grain, at 8, 12, and 4 o'clock. These drugs are given in reduced dosage for two or three weeks. The patient is allowed to get up on the third day, if he feels like it. Baths are continued every other day. Light, regular meals are allowed on the third day and increased as the patient's appetite gets better. As a rule, the patient improves rapidly and soon feels better than when taking opiates.

Drug users can stand large doses of purgative medicines. Calomel will not salivate when combined with other purgatives and followed by a saline to properly work it out of the intestines. The gums may become a little tender, but this will pass away in a few days. Drug patients will also tolerate large doses of hypnotics and will take 90 to 100 grains of trional (in three doses) during the first day of the special treatment, without bad effects. Anuria occurred in one patient, but Rucker believes this was due to the patient's condition rather than to trional. The electric light bath is extremely useful; it is a powerful stimulus to the general circulation of the blood and increases the action of the skin and kidneys. It is also calmative to the nervous system and induces sleep. Rucker has taken patients off of morphine without giving the electric light bath, but they do so much better with it that it has become part of his routine treatment.

ACIDOSIS: ITS CAUSATION AND TREATMENT.

COOPER in the *Clinical Journal* of November 24, 1915, reminds us that acidosis occurs typically in diabetes, where it is the invariable forerunner of coma. It occurs in a large number of other conditions apart from any glycosuria—*e.g.*, in starvation, cancer, anemia, gastric ulcer and other disturbances of the gastrointestinal tract, exhausting fevers, and other conditions of impaired nutrition or deficient assimilation. It also occurs in uremia, the toxemia of pregnancy, many cachectic states, and after operations and general anesthetics, especially chloro-

form. There can be no doubt that the presence of acetone and its associated fatty acids in the blood is not only a grave condition in itself—the acids themselves being highly toxic to the blood and tissues, and interfering with "internal respiration," as shown by the great collapse, anemia and air-hunger, the emesis, the practical suppression of urine, the albuminuria, etc.—but it also denotes a profound disturbance of metabolism in general. Nitrogenous equilibrium is no longer being maintained, and the output of nitrogen greatly exceeds the intake, which may be *nil*. The reserve of carbohydrate (glycogen) in the body is used up, and the nitrogenous tissues have themselves to supply the place of the protein element of the food—the individual is literally living on his own tissues. The disintegration of the tissue proteins results in their separation into a nitrogenous and a non-nitrogenous moiety, and from the latter by a further decomposition are probably formed fatty acids (acetoacetic and B-oxybutyric, etc.), which are found in the blood in the condition of acidosis. But whatever be their mode of origin in the blood the presence of these acids can be readily demonstrated. The seriousness of the acidosis is quickly appreciated when we remember that one of the essential respiratory functions of the blood is the removal of CO_2 from the tissues. This is ordinarly accomplished by fixing it with the normal alkali of the blood. In acidosis the normal alkali of the blood is neutralized by the abnormal acids present, hence the great dyspnea or air-hunger, which, however, results not so much from a deficiency of oxygen as from a poisoning with carbon dioxide. For the same reason the relief which promptly follows the intravenous infusion of alkali far exceeds any derived from the inhalation of pure oxygen.

Without going further into the pathogenesis and organic chemistry of the condition, it is sufficient for the present to lay stress upon the importance of the early detection of acidosis in all grave cases of illness, especially where there is impaired nutrition of any kind. In diabetes it is a state always to be kept in view and prevented as far as possible. In non-diabetic conditions, however, its results may be hardly less serious. Patients with well-marked acetonemia who are unable to take food are undoubtedly in jeopardy; they need constant watching and attention. They should be placed in the charge of a day nurse and a night nurse, and should be under frequent medical supervision. At the least sign of collapse strychnine, digitalin, caffeine, and even ether may be required hypodermically. Oxygen, if available, may be of slight service, but the most urgent indication is to neutralize the acid in the blood by means of an alkali. In extreme cases the alkali may be given intravenously. We cannot, however, introduce an unlimited amount of alkali into the blood without causing serious cardiac depression. As a rule not more than 2 or 3 pints of a 6-per-cent solution of sodium bicarbonate, suitably filtered and sterilized, should be given, under strict aseptic conditions, at the temperature of the body, and very slowly admitted—say, taking half to three-quarters of an hour for the injection.

Neutralizing the acid in the blood does not prevent its formation, however, and to secure this we must endeavor as quickly as possible to reëstablish normal metabolism. This can be done only by supplying food, which, again, can be achieved only by rendering the alimentary canal fit to take in and assimilate food, for it is found that as soon as carbohydrate food can be absorbed and utilized the nitrogenous excretion greatly diminishes and the acidosis lessens. The indications are to clear the alimentary tract of its impurities and to try to reëstablish its secretions. If incessant vomiting is present the stomach-tube should be promptly used, and the stomach washed out with sodium bicarbonate solution (one or two drachms to the pint), a few ounces of pure solution being left behind in the stomach.

If the patient is not sick a good purgative should be immediately given—*e.g.*, 5 grains of calomel followed by saline, or 1 ounce ol. ricini, etc. Failing this the bowel should be emptied by enemata; rectal salines combined with sodium bicarbonate can then be given at four-hourly intervals. As soon as

the stomach will retain it an alkaline mixture is given by mouth. Carbohydrate food in an assimilable form is commenced at the earliest moment, and for this purpose Benger's food answers extremely well. As soon as possible the patient should be got into the open air. Great care in regard to diet, regulation of the bowels, mental and physical effort, etc., must be exercised for a considerable period afterwards to avoid a serious relapse.

ACTION OF LETHAL DOSE OF STROPHANTHIN IN ANIMALS.

The *Journal of Experimental Medicine* of November 1, 1915, contains an article by JAMIESON on this subject. He believes that when a like amount of strophanthin is injected intravenously, the mortality is the same in both normal cats and in cats suffering from experimental pneumonia.

The minimum lethal dose of strophanthin is the same in normal dogs and in dogs suffering from experimental pneumonia.

The presence of an acute infection in these animals does not interfere with the action of strophanthin on the heart.

Electrocardiographically the changes occurring in the heart's action when strophanthin is injected are found to be similar in normal and in infected animals.

The identity of strophanthin action in infected and normal animals renders it probable that a like similarity may be anticipated in man, under normal conditions and in pneumonia.

RESEARCHES ON THE PERFUSED HEART.

In the *Quarterly Journal of Medicine* for October, 1915, BURRIDGE reaches these conclusions from a research:

1. The two muscular functions of contractile capacity and ability to contract with respect to excitation by induced shocks are entirely distinct. A muscle may have an intact store of contractile material able to contract, and yet, owing to the loss of excitability, give no evidence of this on attempted excitation by induced shocks.

2. In every heart so far examined it has been found possible by appropriately employing potassium salts to demonstrate the presence of a certain stock of contractile material. For brevity this capital stock is designated C. C is a quantity varying from heart to heart, but constant in value under ordinary conditions in any particular heart.

3. The variations in amplitude of the spontaneous contractions correspond to variations in the proportion of the total contractile material evoked by the normal stimulating agency of the blood. They lie apparently indefinitely between the limits zero and C. But at any point of these variations, unless some rigor-inducing agency has been employed, it is possible to show, by using the appropriate salt of potassium, that the heart maintains an unaltered capital stock of contractile material.

4. The majority of drugs, though they may cause very great variations in spontaneous activity, do not alter the value of C. Its value seems only altered by coagulation or rigor.

5. Two groups of phenomena are described in the frog's heart, to each of which the term cardiac failure is applied. They are: (*a*) cases in which the amplitude of these spontaneous contractions has increased, but in which by using potassium it can be shown that the capital stock of contractile materials is undiminished—C unchanged; (*b*) cases in which the amplitude of the spontaneous contractions has diminished, accompanied by a corresponding diminution in the amplitude of the contraction then evoked by potassium—C diminished. The two types may be combined in any one heart.

6. Digitalis can restore the amplitude of the spontaneous contractions toward their original value in cases of the first type only. Accordingly it is concluded that the condition of the heart in clinical cardiac failure is of that type also.

7. An examination of cases of the first type shows that the failure in them results from alteration in the relation of the heart to the calcium in the solution perfusing it. Two subdivisions are found. There are

(*a*) cases in which the heart-beats are diminished in amplitude consequent on a decreased tension calcium in the perfusing solution, the heart itself remaining 'normal;' (*b*) cases in which the composition of the perfusing fluid remains constant, but in which the heart itself reacts less vigorously to calcium than it did originally.

8. The mechanism for maintaining and utilizing the cardiac reserve is suggested to be as follows. The heart has a certain capital stock of contractile material, the activity of which is evoked by the calcium of the blood. Under ordinary circumstances the relations between the heart and the blood calcium are such that the calcium evokes the activity of a certain proportion of the whole. By altering the magnitude of response of the heart to calcium a greater or less proportion of that whole is rendered active. During sympathetic stimulation a given tension of calcium can evoke the activity of a greater proportion of the whole cardiac contractile material than was the case before such stimulation.

9. In clinical cardiac failure the response of the heart to such amounts of calcium as are present in the blood is sufficient to maintain an adequate circulation. Digitalis is a drug which enables a given tension of calcium to evoke the activity of a greater proportion of the whole contractile material than is the case in its absence.

THE PUERPERIUM.

ARNOLD in the *New York Medical Journal* of December 4, 1915, in a paper on this topic condemns a number of common practices in obstetrics. He begins with one of the first routine acts in the puerperium—the application of the abdominal binder. It may be obstetrically sacrilegious to say it, but he certainly believes it is a mistake to suppose that a "high stomach" may be avoided, postpartum hemorrhage prevented, or the process of involution favored by boxing up the uterus in abdominal pads placed "exactly so" and held there by a tightly fitting abdominal binder, which pads and binder, fortunately for the patient, remain "exactly so" for only a very brief length of time. The latter fact in itself is sufficient proof of the uselessness of the practice. If the binder is used at all, let it be a simple one, that for a few hours may conduce to the mental and perhaps physical comfort of the patient, and at the same time not prevent the physician or nurse from easily observing the condition of the uterus. There have been a number of harmful effects charged to this indefensible pad and binder tradition, but there is enough to condemn it without admitting these. The false feeling of security that the practice engenders, the prevention of that very desirable oversight of the uterus in the first few hours of the puerperium, and the entire uselessness of the procedure are sufficient reasons for its discontinuance.

Second, it is a mistake to attempt to keep every puerperal woman flat on her back for a great length of time. Of course there are exceptional cases in which such treatment may be advisable to have the woman remain quietly on her back for a few hours postpartum, but in the great majority of cases routine orders to keep the patient on her back have no other justification than the physician's fear to depart from common practice.

In the first place, such orders are seldom obeyed, and in all but the exceptional cases it would be imposing an unnecessary hardship, or doing the patient a positive injury, if they were obeyed. To permit a woman to move from side to side, to be raised up in bed when necessary, and to have the greatest freedom consistent with her strength, will not only add greatly to her comfort, but will facilitate drainage, aid the pelvic circulation, and favor involution.

Third, another rather prevalent custom that seldom has any reasonable argument in its favor, is that of starving the puerperal woman for the first three or four days. Arnold has often asked those who still adhere to this tradition to give him their reasons. Thus far he has not yet received a reply that he would consider worthy of discussion. For years it has been his practice to feed his puerperal patients in

accordance with their needs and desires, even to the extent of a full meal within twenty-four hours, or as soon as the appetite demands it; and he has never seen any ill effects or any reason to revert to the old starvation diet. On the contrary, he is satisfied that this judicious liberality in food, and in the postpartum activity, has given better lactation and an earlier and more satisfactory convalescence.

Fourth, it is usually if not always a mistake to suppose that an elevation of one or more degrees of temperature without any apparent cause is gastrointestinal in origin. What a host of little sins of omission and commission are covered by this much-used gastrointestinal cloak! As an excuse it is almost as much overworked as the old "catching cold" explanation used to be. Nor do those who still hold to this self-excusing view prove their contention by citing many cases of moderately elevated temperature that clear up under active catharsis. A mild degree of infection or of sapremia, as such a temperature practically always indicates, may often be favorably influenced by the increased elimination, the stimulated pelvic circulation, and the facilitated drainage produced directly or indirectly by a purgative. The treatment may be very good, but this does not explain the cause and should not console the obstetrician into the belief that he is not to blame, and thus prevent his making a closer and more critical study of his technique and of the conditions of the birth canal, with a view to preventing such infection in the future.

Arnold can see no reasonable ground for believing that such temperatures are due to a day's constipation. Just why the failure to have a bowel action for a day or two should suddenly begin to produce elevation of temperature in a woman whose normal habit all her life, perhaps, has been one of constipation, is something he has not yet seen explained by those who profess to believe in it. His own treatment in such cases (and we all have them now and then) is to give whatever attention is necessary to the bowels—that, of course, is important; but more important is to increase the patient's resistance with the stimulation of good food, to quicken her pelvic circulation by allowing her a reasonable amount of activity, and to favor better uterine drainage by elevating the head of the bed (or having the patient sit up), and to stimulate uterine contractions both manually and with drugs. And this leads him to note that the fifth rather frequent mistake he has seen is that of thinking that a postpartum high temperature such as this, which does not readily clear up with a purgative, or that is accompanied by a foul discharge and some tenderness and subinvolution of the uterus, is an indication for intrauterine douches, curettage, or other such questionable interference. More than once has he seen this mistake lead to prolonged and serious illness, and even to the death of the patient. A safe rule in such cases is to keep out of the uterus absolutely, even though one may suspect or believe that there are retained secundines. Facilitate drainage, as Arnold has just indicated, by elevating the head of the bed, and give one or more doses of pituitary extract or of ergot, or both. These drugs, with a little massage, will often contract down a boggy, subinvoluted uterus, force out old clots and sapremia-producing débris, and thus readily and safely lower a bothersome temperature.

Sixth, another traditional custom still widely prevalent in general practice, and, strange as it may seem, still taught in some text-books and medical schools, is that of attempting to dry up the lactating breasts by various internal medicines and applications. When for any reason, such as the death of the child, there is no demand for lactation in the puerperium, or when at a later period, as at weaning time, it becomes necessary to take the child from breasts that are in full function, the question of what to do to dry up the milk is often an urgent and important one. It seems to be very difficult, both for the profession and the laity, to get away from the old idea that some more or less complicated or specific treatment must be employed for this purpose.

Generation after generation of text-books and obstetric teachers have so instilled this

ancient delusion into the minds of the profession at large, that we cannot wonder that many physicians still cling to it. Some years ago Arnold had occasion to make a little study of this question. He found at that time that nine out of twelve modern works on obstetrics recommended for drying up the milk a varied and extensive line of treatment, including potassium iodide, potassium acetate, camphor, chloral, ergot, atropine or belladonna in some form, either internally or externally or both, electricity, lead-water and laudanum, all kinds of salves and poultices, with saline purges, restriction of diet, massage, breast pumps, and tight binders—any and all of which have long since been repeatedly proved not only to be unnecessary but absolutely useless.

With so many of the leaders in the profession still giving out these antiquated ideas on the subject, it is little wonder that each family doctor has his own pet method, or is obliged to vie with the laity in the number if not the absurdity of the remedies recommended. The one simple and invariably successful method, of course, is to let the breasts absolutely and severely alone. This has been demonstrated so often and so conclusively now that it seems superfluous to speak of it again. Yet it may be worth while very briefly to refer to a few practical points that may make or mar the success of the treatment.

Letting the breasts alone means, of course, the prevention of all local stimulation, and this usually means that all arm movements that disturb the mammary glands must be for a time prohibited: for instance, the attempts of the patient to comb her hair. Arnold used to make the mistake of torturing these women with a tight breast binder, but this also is wholly unnecessary, and gives no better results than a simple supporting sling. The breasts, when thus let alone, will of course overfill and often become quite painful for a day or two, but they will do this under any treatment unless the milk is drawn, and it is better to relieve the pain with a narcotic than to use the breast pump. Mammary abscess need not be feared unless surgical cleanliness is grossly neglected. Arnold has used nothing but this let-alone treatment for the past ten years, and has never had an abscess and never a failure to get prompt and satisfactory results, except where the patient or nurse was too skeptical to obey orders. It seems reasonable to suppose that the restriction of liquid foods would have a good effect, but Arnold has not found it so. Nor, let him say in passing, has he found that the quantity and quality of foods, liquids, and stimulants ordinarily used to increase the flow of milk have half as much effect for this purpose as local stimulation by massage, heat, and systematic nursing.

Seventh and finally, there is the mistake so commonly made of having a routine time for getting the patient up after confinement. The question as to when a woman shall leave the lying-in bed is often determined more by the age of the baby than by the condition of the mother; by the number of the day rather than by the degree of involution. There is a wide range of practice in this respect, from those who regularly get their women up on the third or fourth day, to the more conservative men who seldom allow a patient out of bed under two weeks. The point Arnold makes is, that it is a mistake to fix upon any day, early or late, as a routine time for getting puerperal patients up. They are certainly not all alike; why should they be made to conform to a common rule? Careful examination will show that one woman is as far advanced in the process of restoration on the sixth day as another equally well appearing woman is on the twelfth day. It would be injustice to both women to make them conform, for instance, to a "ninth day" rule. Lack of space forbids discussion of the several factors that determine whether the puerperium shall be long or short. It has been proved beyond any question that the mental and physical energies, in many cases, can be so conserved, by a more liberal use of anesthesia in labor, that the convalescence and time of getting up will be greatly favored. He knows that in his experience, which is not different from that of many others, the judicious use in the first stage of labor

of the morphine-scopolamine combination, for instance, and of chloroform properly administered in the second stage, has so frequently shown a favorable influence in the puerperium that for this reason alone he would feel amply justified in the use of these drugs.

RADIUM IN THE TREATMENT OF CARCINOMAS OF THE CERVIX UTERI AND VAGINA.

In the *Journal of the American Medical Association* of November 27, 1915, KELLY and BURNAM state that they are convinced that radium is of exceedingly great value in the treatment of cancers of the cervix uteri and vagina.

They expect with all confidence that the results in the next 200 cases will far surpass those reported now.

They again emphasize that the betterment in the improved but not cured cases is so marked that it alone makes radium a great addition to existing methods and would justify its use.

They believe that every inoperable cancer of the cervix uteri or vagina, provided general metastasis is not evident, stands a chance of at least 1 in 4 of cure by radium treatment.

There is marked reason to believe not only that a large number of inoperable cases are curable, but that by the joint use of radium and operation the 1-in-4 cure rate of operation in operable cases may be raised to 3 in 4 or better.

The authors have seen that some cervical cancers do not respond to radium treatment. This same variation in reaction occurs in many other types of neoplasm. It is apparently due to a lack in the patient of resistance to the specific growth. Work should be directed toward determining where the body products which attack a radiated cancer arise and what they are. On account of the certainty that some of the operable cancers of the cervix would not be cured by radium, and also on account of the necessity of having many patients over five years cured in order to be sure of the permanency of the results, they advise, in operable cases, hysterectomy and radiation. This is the rule in clearly operable conditions. In border-line cases, they advise the use of radium, as the permanent cures from operation are not numerous in this group. If the growth does disappear, it can only be determined whether or not hysterectomy is advisable by trying out both methods; this as yet has not been done in a sufficient number of cases to arrive at any definite conclusions. They do feel, however, that when clinical cures have occurred in inoperable cases, operations are probably best not carried out. Manifestly an inoperable case which becomes operable but does not entirely heal should be treated by operation.

Finally, they desire to restate most emphatically that radium can and should be used in these cases without any local or general injury to the patient treated.

DUODENAL ULCER.

MULLINS in the *New York Medical Journal* of December 4, 1915, says that in considering the treatment of duodenal ulcer, it must be admitted that in the acute and early stages of its development medical and hygienic methods are beneficial and often curative, but when the condition has repeatedly recurred or does not respond after a reasonable trial of palliative means, it must then be designated a chronic ulcer, the treatment of which resolves itself into surgical procedure. Several operations have been devised, the details of which he will dwell upon only to call attention to their comparative value. They are: Excision; one or other form of pyloroplasty; gastroduodenostomy after Kocher; gastrojejunostomy, either anterior or posterior, with or without plication at the pylorus.

Excision can be practiced only when the ulcer is small, lest too great a narrowing of the duodenum result, unless by resection of the first part of the duodenum and the pylorus with the subsequent gastroduodenostomy.

Pyloroplasty after the Heineke-Mikulicz method—incision in the long axis of the gut with suture in the opposite direction—

is applicable in cases of mild stenosis, while in more pronounced forms the Finney or horseshoe incision has the advantage of affording a larger and freer opening from the stomach to the bowel.

In cases in which the pylorus is bound down by adhesions and in a state of marked induration, the Kocher gastroduodenostomy offers a less difficult means of procuring the same result.

The anterior long loop gastrojejunostomy has become less popular owing to the danger of vicious circle, unless provisional entero-enterostomy is employed.

The operation of choice in the majority of cases seems to be the no-loop posterior gastrojejunostomy, with or without the infolding of the ulcer as the case demands. To compare pyloroplasty with this operation, the latter has the advantage that the period of convalescence is shortened and the relief from symptoms more immediate, which alone, all else being equal, would warrant its application.

THE EFFECT OF TYPHOID VACCINATION ON THE WIDAL REACTION.

In the *Journal of the American Medical Association* of November 27, 1915, HAMILTON says he wishes to emphasize the fact, as already stated by Hirschbruch, that a positive Widal reaction in any person who has ever been inoculated with the antityphoid vaccine is of no value in diagnosing typhoid fever. The only reliable way of ascertaining the cause of continued fever when typhoid fever is suspected is by the blood culture and a total and differential leucocyte count.

THE CITRATE METHOD OF BLOOD TRANSFUSION IN CHILDREN.

In the *American Journal of the Medical Sciences* for December, 1915, LEWISOHN claims that the citrate method of blood transfusion which he described in January, 1915, has rapidly gained great popularity. Theoretical objections against the mixture of blood with an anticoagulating substance have been overcome by practical experience. This has proved that the citrated blood is clinically as effectual as pure blood. The great simplicity of the method, which makes blood transfusion as easy as an ordinary saline infusion, has, of course, widened the applicability of the former, even in smaller communities, and will certainly serve to popularize blood transfusion.

The effectiveness of citrate of soda as an anticoagulant is, of course, nothing new. In fact, we all know that for many years it has been used quite extensively in the laboratories for the purpose of preventing blood from clotting. The dose used for this purpose was one per cent.

Lewisohn has often wondered why so much time has been spent in devising technically most complicated methods (vessel anastomosis, syringes, etc.) instead of applying this well-known drug in human blood transfusion.

His answer is given in the experimental part of Lewisohn's work, which he published in detail a few months ago. These experiments brought to light two important facts:

1. That it is unnecessary to use 1-per-cent sodium citrate to prevent coagulation of the blood, but that 0.2 per cent suffices.

2. That sodium citrate used at the ratio of 1 per cent would prove fatal in large transfusions of blood (1000 Cc.).

This fact answers the question why sodium citrate has not been applied before in human blood transfusion. The fear that this anticoagulant might prove to be toxic when used in large doses is a well-founded one. That sodium citrate may be safely applied for intravenous injection of large quantities of blood, without risk or danger to the patient, is based on the fact that Lewisohn's experiments showed that a mixture of 0.2 per cent citrate of soda is sufficient to prevent coagulation.

These results of his animal experiments were of special importance on account of another publication on this subject which appeared contemporaneously with his. Weil reported that he had injected up to 350 Cc. of blood mixed with 3.5 grammes of sodium citrate. He had used this large dose of

citrate because, evidently through some error in his experiments, he had come to the conclusion that 1 per cent sodium citrate (*i.e.*, the dose used in laboratory work) was necessary to prevent coagulation. There was no warning in his paper against the possible toxicity of sodium citrate at the 1-per-cent ratio. Lewisohn's experiments show conclusively that if anybody had applied Weil's dose for a large transfusion on the human being the results would have been fatal. The citrate method, which has proved harmless and efficient, when applied at the 0.2-per-cent ratio, would surely have been abandoned after a few trials if his experiments had not pointed out the toxicity of Weil's dose and thus prevented others from using citrate at the ratio of 1 per cent.

The atoxicity of sodium citrate at the 0.2-per-cent ratio (*i.e.*, 2 grammes of sodium citrate to 1000 Cc. of blood) is best proved by the use of this method for transfusion of blood in small children. Blood transfusion in infants has great possibilities. Melena neonatorum, primary and secondary anemias, typhoid hemorrhages, some cases of marasmus, etc., yield remarkably well to blood transfusions and often show most startling results. All the older methods presented the greatest technical difficulties when applied in these little infants, and therefore blood transfusion has not been used sufficiently in small children.

The technique is exactly the same as described for adults. The donor's vein can be punctured proximally or distally, the direction to be chosen according to the individual case, whichever way the blood runs with the greatest facility into the glass receptacle. The blood is mixed in the glass jar with a 2-per-cent sterile solution of sodium citrate at the ratio of 1 to 10 (*i.e.*, 10 parts of solution to 100 Cc. of blood). For the reintroduction of the blood a very fine needle or cannula can be chosen. Thus one can inject the blood even in small children through a superficial arm vein of the finest caliber. This obviates any extensive dissection. By using so fine a needle one assures the slow injection of the blood and prevents the danger of sudden overloading of the circulatory system. A salvarsan flask is attached to a stand and the blood allowed to run into the vein drop by drop (in one case the injection of 350 Cc. thus took nearly an hour, and the three-year-old child stood this rather large quantity of blood very well, just on account of the slow injection).

IRREGULARITY OF THE HEART-BEAT.

The *Clinical Journal* of November 17, 1915, contains an article by CATTLE in which he reminds us that the presence of auricular fibrillation is an important sign of heart failure, and doubtless greatly aggravates other preëxisting mechanical difficulties due to dilatation, valvular defects, etc. Further evidence of failure, such as edema of the feet or lungs, breathlessness or orthopnea, enlargement of the liver, etc., may be eventually expected in cases in which fibrillation is persistent.

While digitalis is useful for the purpose of toning up the cardiac muscle in dilatation and many forms of cardiac weakness, it is in cases of fibrillation that results are often achieved which exceed in brilliance those due to the use of the drug in any other circumstances. Doubtless the tonic action of digitalis on the muscle and on the vagus nerve partly accounts for this favorable result, but considering that the effect is so much greater in fibrillation than in other forms of irregularity, it seems most probable that the more regular and more forcible contractions of the ventricles are due also to the "blocking" action of digitalis, by means of which some of the abnormal impulses from the fibrillating auricles are cut off. In using a powerful drug like digitalis it is necessary to have a clear conception of the conditions it is likely to benefit. There could be no greater mistake than to give it indiscriminately to every patient who has a murmur. This drug should not be given for premature systole, as the disturbance is one digitalis is very liable to produce. It may be given cautiously in heart-block. [Freely if the block is complete.—ED.]

The dose of tincture of digitalis which should be given in cases of fibrillation is 15 minims four times a day, or slightly larger doses of the 1914 preparation. In case of urgency the dose may be increased or supplemented by the injection of five-minim doses of Hoffmann's digalen. The pulse generally drops from upwards of 100 to about 60 within a week. This is a signal for withdrawing the drug for a few days. It should be resumed as the rate of the pulse increases, and continued in such doses as will keep the pulse-rate about 70. Signs of digitalis sufficiency which call for its suspension or reduction are: Slow pulse; vomiting; loss of appetite; diarrhea; scanty urine; coupled beats. Cases of sudden death from digitalis are invariably due to neglect of warning signs. Dr. Mackenzie speaks of the "characteristic coupled beats" as a sign of sufficiency, and Dr. Lewis says "the appearance of coupled heart-beats is always a danger-sign."

THE TREATMENT OF BLACKWATER FEVER.

The *Lancet* of November 20, 1915, in discussing this subject points out that it is obvious that the treatment of a disease the etiology of which is still undetermined will be attended with logical difficulties. An example of this is to be found in blackwater fever, respecting which many and diverse theories have been advanced in explanation of its probable causation. The treatment of this grave malady must necessarily depend to a large extent upon the views which the practitioner holds regarding its origin.

Burkitt, of the East African Medical Staff, reports on a method by which he has been successful in treating some serious cases of blackwater fever by the administration of potassium and sodium bicarbonate and chloride of calcium. These remedies he regards as "blood alkalinizers," and his view appears to be that the symptoms in blackwater fever are in all probability due to a lessened alkalinity of the blood, this being a "by-product" of the condition preceding hemoglobinuria, and that this "by-product" when it reaches a certain point causes a breaking-down of the blood elements. This acid poisoning (a greatly lessened alkalinity of the blood) shows itself by the presence of acetone and aceto-acetic acid in the urine.

Burkitt's careful observations seem to be in accord with those of some other authorities. Major A. C. MacGilchrist, I.M.S., for instance, stated in 1912 that his own studies in connection with the hemology of quinine and its salts had suggested to his mind the existence of a diminished alkalinity of the blood in blackwater fever, and that if the examination of the blood and urine of such a patient proved the existence of "acidemia" the prophylaxis and treatment would be simplified. He also expressed the opinion that the action of quinine, like that of the salicylates, should be guarded against by the administration of alkalies in all cases where an attck of blackwater fever was feared.

The number of cases reported by Burkitt is perhaps too small to enable us to base upon them any definite or final conclusions as yet, but they indicate that the administration of alkalies, in the circumstances which he mentions, has been attended with very beneficial results. The method is therefore well worthy of a trial by those who are called upon to treat this very grave disorder of the tropics.

THE ACTION OF RADIUM ON CANCERS OF THE PELVIC ORGANS.

SCHMITZ in the *Journal of the American Medical Association* of November 27, 1915, reaches these conclusions:

1. The best method of applying radium is the interval method by which from 3000 to 4000 milligramme hours of radium element are applied within from about fourteen to twenty-one days.

2. The alpha and beta rays must be arrested by a brass filter of from 1 to 1.5 mm. thickness.

3. The secondary rays, forming in the metal filter, are rendered inert by a rubber cot of from 1 to 3 mm. thickness.

4. Inoperable cancers that are not far ad-

vanced so that cauterization is not contraindicated yield satisfactorily to radium therapy.

5. Advanced inoperable and recurrent cancers are ordinarily refractory toward the radium rays. Any improvement is at least very temporary.

6. The patients treated with the rays after surgical removal of the organs have done well, although the time elapsed since the treatment averages eight months.

7. Patients suffering from cancer should be treated surgically, and then radiologically, and if surgery is contraindicated they should receive radium treatment, which at least relieves the subjective symptoms and often the objective ones.

8. The time elapsed since the commencement of the radium treatment in all the cases enumerated is too short to permit definite opinion as to the remote results of radium treatment.

9. Clinical and histologic studies enable us to pronounce the radium rays a valuable addition to the therapy of cancer.

10. It will require years of constant observation to demonstrate such results as anatomic cures.

11. The same measure that is applied to establish the efficacy of surgical procedure in cancer treatment must certainly be employed in radiotherapy.

THE MEDICAL ASPECTS OF EMPYEMA AND PULMONARY ABSCESS.

Discussing this subject in the *Boston Medical and Surgical Journal* of November 25, 1915, LORD says regarding treatment that it is important to remember that while surgery offers the greatest hope it is not to be applied indiscriminately to every case, and that other and simpler measures may be expected to be of distinct advantage. All patients with symptoms of sepsis should, of course, be abed. An abundance of nourishing food and fresh air are of importance. The toxemia and general sense of ill-being may be lessened by cautioning the patient not to swallow his sputum. The effect of posture should invariably be given a thorough trial. Evacuation may be favored if the patient lowers his head over the edge of the bed during a paroxysm of cough. At stated intervals and for a certain period the patient should lie with the affected side uppermost with the purpose of draining the pus into the trachea. Elevation of the foot of the bed for a time night and morning, the patient meanwhile lying at full length on the back or abdomen and without a pillow, should be tried.

In deciding between expectant treatment and surgery, the clinical aspect is of prime importance. The general appearance of the patient and the degree of sepsis, measured by the temperature curve, the pulse-rate, sweats, chills, and the white count, are valuable guides. A daily record of the cough and the amount of expectoration are important for the estimation of progress. Persistent septic features, with an increasing amount of sputum and abundant elastic tissue or lung shreds, indicate an advancing lesion. The chances of surgical relief diminish with the lapse of time. Of 31 operated cases, in 19 with a previous duration of nine months or under, 5 died and 1 was not relieved, the result thus being unsuccessful in about one-third of the cases; while of the remaining cases, 7 were relieved and 6 cured, a favorable outcome in about two-thirds of the cases. Of 12 cases with a previous duration of nine months to two years, 5 died and 2 were not relieved, the attempt at relief thus failing in about three-fifths (58 per cent) of the cases, while the remaining 5 cases obtained notable relief, but as yet no permanent cure. A more extensive lesion, multiplicity of foci, and the presence of dense induration about the affected regions probably account for the less favorable result in the more chronic cases.

The indications for or against operation are difficult to formulate, and each case must be decided on its merits, but as a general rule it may be stated concerning the acute cases that in the presence of a small process, without marked symptoms of sepsis, with purulent and not foul expectoration and without a large amount of elastic

tissue or lung shreds, an expectant policy may be followed. If, after observation for three to four weeks, recovery or marked improvement does not occur, operation should be considered. Operation is indicated, on the other hand, with an extensive process, marked sepsis, putrid sputum, and abundant elastic tissue or lung shreds. The exigencies of the individual case determine the propriety of operative interference in cases which have lasted for months or years. The condition may be intolerable to the patient or so menacing to life as to justify surgical intervention, even though little more than partial relief may be expected. Circumscribed, inextensive and single lesions offer a greater hope of success.

The advantage of surgery over the expectant treatment of abscess or gangrene cannot be estimated alone by the mortality returns, which, though sufficient to prove that surgery is the more effective, do not tell the whole story. The observation of cases before and after operation, even when the outcome is unfavorable, oftentimes indicates that the operative procedure was justified, as indicated by diminution in the degree of sepsis and the amount of foul sputum, and if performed earlier or under more favorable local conditions might well have been successful in effecting a cure.

OBSERVATIONS UPON THE ETIOLOGY AND TREATMENT OF HEART DISEASE.

In the *Boston Medical and Surgical Journal* of December 2, 1915, WHITE reaches these conclusions:

1. The male sex has been found to be more subject to auricular fibrillation, auricular flutter, heart block, and alternation of the pulse than has the female sex.

2. The older the patient with heart disease the more subject he has been found to be to serious abnormalities of the heart-beat.

3. Auricular fibrillation and alternation of the pulse occur at the same ages, and most frequently in the fifth and sixth decades.

4. Rheumatic hearts usually show normal mechanism or auricular fibrillation, much less commonly pulsus alternans.

5. A considerable percentage (36 per cent) of syphilitic hearts showed alternation of the pulse; few were fibrillating.

6. A patient with cardiac insufficiency in the course of cardiorenal disease was very apt to show pulsus alternans, either constant or more frequently only after ventricular premature beats.

7. Cardiosclerosis often resulted in the production of fibrillation and alternation.

8. Hyperthyroidism of long standing was sometimes attended by auricular fibrillation.

9. Alcohol, tobacco, tea, and coffee appeared to play no direct part in the production of serious disorders of the heart-beat.

10. Two-thirds of the patients with auricular fibrillation, one-half of those with alternation of the pulse, and one-third of those with normal mechanism in the present series showed physical signs of cardiac insufficiency.

11. Digitalis was used in 88 per cent of these decompensated cases, almost always in the form of pills of standardized leaves. Intravenous medication was used in urgent cases only.

12. Morphia was given beneficially in nearly one-half of the patients with physical signs of insufficiency, often one dose sufficing to give the patient the first comfortable night in weeks.

13. Venesection was found useful in a few urgent cases.

14. The change in diet to five small meals daily was often much appreciated by the patient.

1000 DOSES OF PHENOLPHTHALEIN.

In the *Lancet* of November 20, 1915, MCWALTER says that intestinal stasis is now made accountable for many ills, and the vogue of the motor-car and the electric tram makes walking a thing of the past. There are those who believe that appendicitis results from constipation, and certainly the laity look on daily evacuation as the first object of him who would attain health.

Distinguished surgeons are prone to write

up their first hundred cases of operation for proctitis, or what not, and it may be permitted the mere practitioner to record the results of some hundreds of doses of a given drug. McWalter has prescribed rather more than 1000 doses of phenolphthalein, and finds it probably the most useful laxative in the Pharmacopœia. It is a crystalline, odorless, coal-tar product of the formula $C_{20}H_{14}O_4$, slightly soluble in water, freely soluble in alcohol, and giving a beautiful pink color with alkalies. The dose for children is ½ to ¾ of a grain, and for adults 2 to 6 grains. He has given it usually in doses of about 1½ grains, repeated from two to three times a day; it produces loose motions in from four to six hours after a dose of 3 to 4 grains, but where smaller doses are given it brings on a natural or somewhat soft and copious evacuation only once or twice daily. It is singularly painless as a rule. This is its chief advantage. Further, it does not seem to lose its effect, at least, until it has been persisted in for a considerable time. Some observers state that it occasionally becomes absorbed, acting on the kidneys and causing backache, but McWalter has not observed this in small doses. Its action is very much like that of cascara sagrada, but probably more active and less griping. He has given it in many cases of pregnancy, and it seems almost an ideal laxative for that condition. It should not be given in tablet form unless mixed with chocolate, but it may be given in powder or in cachets.

It seems to McWalter that phenolphthalein is particularly useful in cases of intestinal toxemia. It appears to offer almost ideal advantages as a medicament in these cases, because obviously what is required is a mild antiseptic, capable of being taken for a considerable period without toxic or cumulative effects, and yet free from those irritating effects on the mucous membrane of the intestine which render most purgatives harmful in such cases. In chronic mucomembranous colitis the use of intestinal antiseptics is generally disappointing, but he thinks that phenolphthalein will be found, in doses of half a grain thrice daily, eminently satisfactory in preventing enterospasm, easing pain, checking the excessive secretion of mucus, improving the neurasthenia, and generally improving the patient's condition. Like all drugs of its kind, phenolphthalein has become much dearer since the war, but the dose being so small the actual cost is negligible.

THE INDICATIONS FOR OPERATIVE INTERFERENCE IN CASES OF AURAL DISCHARGE.

In the *Medical Chronicle* for November, 1915, SEWELL states that the signs and symptoms which singly or severally call for interference are:

1. A discharge which persists in spite of treatment.
2. A discharge which is fetid, blood-stained, or contains cholesteatomatous material.
3. Recurring polypi.
4. Carious bone.
5. Fistulæ.
6. Pain.
7. Tenderness.
8. Headache.
9. Vertigo with or without nystagmus.
10. Increase of deafness with diminished bone conduction.
11. Facial paralysis.

PNEUMODYNAMICS OF EMPYEMA.

In a paper on this topic in the *Boston Medical and Surgical Journal* of November 25, 1915, COTTON discusses the question of drainage in empyema. He says that most important of all (next to making a hole) is the cleaning out of the cavity, and here is where many operations fail. In certain cases of streptococcus type, the fluid is thin and a small hole is enough. As a rule, however, we are dealing with the pneumococcus and with the massive fibrin layers that characterize this infection. If not removed, these masses inevitably clog any drainage, as they gradually disintegrate after about the third day. It is the presence of this fibrin that makes the mere insertion of a

tube ineffective. Every empyema that will stand three minutes of operation, under light anesthesia, should have a resection of three-fourths to one and one-half inches of rib and an opening into the pleura big enough to admit a finger to sweep about and loosen the adherent fibrin masses. These may be fished out, or the patient may be so turned that the hole is at the lowest point. He will then cough out his own fibrin, and we can put the tube into a cleared cavity.

The old scheme of washing out the cavity is alluring, but not to be allowed at operation or later. Cotton has himself seen two cases of dangerous collapse from irrigation, and there are recorded so many csaes of such collapse, fatal in so many instances, that there can be no argument about the matter. What happens pathologically is not quite clear; it is, clinically considered, a vasomotor affair, and the fatal cases die a "braindeath," long supposed to be embolism. Autopsies have never shown embolism, up to the time Cotton looked the matter up. Let us call it the vasomotor effect of a pleural reflex. At all events, it is too dangerous to trifle with; we may not irrigate!

As to the exact point for drainage, it does not seem to matter much. The Children's Hospital series Cotton looked up long ago seems to prove double drainage of no sort of value. Whether we drain at the eighth rib or the eleventh is not important. We should drain behind, and the scapula is too low for drainage above the eighth. Very low drainage is interfered with by the ascent of the diaphragm during healing. Mechanically it does not seem to matter. Drainage depends on pressures, not primarily on gravity, and an opening at the level of the eighth, ninth or tenth ribs behind fulfils all requirements. Cotton usually resects the ninth just below the tip of the scapula.

As to the tube, the spool tubes (Fowler's tubes) are neatest, but usually do not fit. Two tubes clog as easily as one. Cotton's choice is a tube not less than one-third or more than three-fourths of an inch, inside bore, fenestrated, reaching well into the cavity, not too long (2 to 5 inches, according to the size of the patient), and held by a safety-pin outside the chest.

As to the dressing, it all comes down to a word: drainage is best accomplished by whatever best promotes expansion. We have here no ordinary cavity drainage; pus does not drivel out, but is, or should be, pushed out by the expanding lung.

The question of most importance then is that of reëxpansion. And the question of reëxpansion is the question of negative pressure. Cotton believes absolutely that most empyemas get well by accident; get well because a sloppy, pus-soaked gauze dressing is a very fair valve.

For thirty years past this problem has been rediscovered, and all the means we have to-day have been reinvented, periodically. Cotton did it all in 1900-1901, and was much shocked to find that Perthes and Revilliod had done it years before. It has all been done since, also.

FERMENTED MILK AND WHEY IN INFANT FEEDING.

In the *Medical Record* of December 4, 1915, MUCKLOW states that the following rules are imperative:

Use certified milk. The bottles of milk when received from the dealer and the jars containing the completed mixture should immediately be placed in the ice chamber of a refrigerator, either in the middle of the chamber with a cake of ice on either side of and in contact with them, or what is better, but usually impractical, in a pail full of cracked ice. They should be kept in an upright position until needed.

Use a Chapin cream dipper, that has been accurately made to hold exactly one fluid-ounce, to measure the milk, whey, water, and milk-sugar. The first dipperful from a bottle full of milk should be removed with a teaspoon to avoid spilling.

A dozen vials of a culture of Bulgarian bacilli should be purchased as often as required direct from the laboratory of the manufacturer, immediately placed in the ice chamber of a refrigerator next to the ice, and there kept until used.

The water used in the formulas should be cold and should have been either distilled or boiled for five minutes.

All utensils should be boiled for five minutes just before using them.

Feedings should be warmed by standing nursing bottle containing same in water not hotter than the hand can bear, as too great a heat will toughen the curd.

Use a medium-sized nipple with a single opening. Make opening the proper size by running through it the red-hot point of a No. 7 sewing needle, the eye end of the needle being inserted into a cork to protect the fingers. After each nursing turn the nipple inside out, scrub clean, and place in borax water (one heaping teaspoonful of borax to a cupful of cold, boiled water).

The whey is prepared as follows:

Skim off from the bottle from which the top milk for the formula has been removed enough additional dipperfuls to make a total of 8 dipperfuls removed from the bottle.

Pour the resulting skimmed milk into a quart preserve jar.

Add 3 teaspoonfuls of a good essence of pepsin and stir.

Seal jar and stand in a kettle full of water as hot as hand can bear for one-half hour.

Break up the curd with a long-handled fork.

Strain through two thicknesses of the finest-meshed cheese-cloth one foot square placed on a strainer over a pitcher.

THE PROBLEMS OF NEPHRITIS FROM THE CLINICAL STANDPOINT.

In the *American Journal of the Medical Sciences* for December, 1915, ELLIOTT reminds us that the history of diet therapy in nephritis is dominated by the principle of protein restriction. Modern research during the past twenty years has borne particularly on the mechanism and consequences of retention in nephritis, and the idea of sparing the kidney has been the first rule in diet. In acute nephritis, and during the acute inflammatory exacerbations of chronic nephritis, a large protein intake is undoubtedly unphysiological and exercises an unfavorable influence. During the stormy but relatively short session of acute nephritis the eliminative functions of the kidneys are carried on with difficulty, the renal filter at times refusing even to pass water through it. Attention should consequently be concentrated on the diseased organ, and until convalescence is established, low food intake, even at times to the point of starvation, will best serve the interest of the patient. In such cases for the period necessary the nutritive problem may be submerged in the imperative needs of the choked and irritated kidneys.

In chronic nephritis we are compelled to keep the general condition of the patient more in view. Granting the clinical justification of protein conservatism in the diet therapy of chronic nephritis, it is probable, speaking generally, that its severity and duration are much less influenced by manipulation of the protein ration than is commonly supposed. Efforts in this direction have hitherto been governed by empiricism without scientific means of control, and we consequently have been far too much influenced by routine in the hope of controlling nitrogen excretion, which, after all, can hardly be considered an accurate measure of the gravity of a case. In chronic nephritis, nitrogen excretion is variable beyond explanation, and peculiar kinds of diet do not appear to influence it to any important extent.

So far as can be seen at the present time the only reliable criterion available for regulating the protein intake in nephritis is the determination of the amount of waste nitrogen retention by blood analysis. That it is possible to reduce the urea and waste nitrogen of the blood to normal or less is abundantly proved by the feeding experiments of Folin, Denis, and Seymour, and Frothingham and Smillie. Cases with considerable retention require a restriction of protein, and by this means a return to normal figures may be brought about if the azotemia be not too severe. In cases of outspoken uremia no marked reduction of the azotemia results from a protein-free

diet. Folin, Denis, and Seymour state that the response to the phthalein function test can be reduced by one-half before abnormal accumulation of non-protein nitrogen takes place in the blood. This estimate is in keeping with Agnew's statement that at 40 per cent phthalein excretion cumulative phenomena appear in the blood. In clinical practice then it may be assumed that accumulation of waste in the blood begins at about the point where response to renal function testing by phthalein drops to 40 per cent in two hours.

Routine observations with this readily available test may thus enable one to appreciate, with much greater precision than is possible from clinical observation alone, the point (40 per cent or lower) where positive protein restriction should begin. When the functional index is normal or nearly normal in contracting kidney it is difficult to understand what harm will result to the organs, provided no inflammatory element is present, from a protein allowance based on physiological needs. This being the case, we need no longer feel that some trifling miscalculation in the protein ration will jeopardize the welfare of the nephritic patient, nor that it is necessary to draw fine distinctions between various forms of protein. Aided by periodic functional testing to check up the condition of the kidneys, and with our present knowledge of food requirements for good nutrition, the dietotherapy of chronic nephritis may be adapted with reasonable safety, if not, perhaps, with accuracy, and with due realization that in so chronic a disease general nutrition and kidney conservation should stand on a parity.

TARSAL MASSAGE IN TRACHOMA.

To the *New Orleans Medical and Surgical Journal* for December, 1915, DIMITRY contributes a paper on this topic. He says that this operation is a great advance in ophthalmology, and the improved technique of Vossius and Kuhnt has added increased benefit.

Dimitry's method of performing this treatment in the disease consists chiefly in the manipulation of a metal or glass rod about 8 inches in length and about ¼ inch in diameter. One end of it is smoothly rolled with cotton for about 2 inches and moistened in some such solution as normal salt, boric acid, boroglyceride, or, as is his preference, 1:5000 bichloride. Precede the manipulation by thoroughly flooding the conjunctival folds; if possible dilating the pupil and completely cocainizing the conjunctiva. The dilatation of the pupil should not at any time be neglected in the course of the work. After these preliminaries the lid is turned over. The cotton-tipped end of the rod is now inserted under the tarsus, and in most cases deep into the retrotarsal folds; pressure is made upward and the lid is rolled. The thumb that holds the lid over is pressed down upon it, producing undulations in the tarsus. The contents of the follicles are now pressed out, making the tarsus pliable. In following out the above indications the greatest care must be used against injuring the cornea, not permitting the rod to scrape the conjunctiva. The same method is employed in treating both lower and upper lids. The technique, somewhat difficult of performance at first, soon becomes simple with practice.

The rod manipulation is performed every other day. The patient is encouraged to attempt certain massage by pinching his own lid, and at intervals this is also carried out by the ophthalmologist. The tarsus is caught between the index-finger of both hands, and is squeezed and massaged.

The results obtained have been gratifying to Dimitry and the members of his staff, and they believe that in every case which has permitted of sufficiently long treatment they can claim a cure. The treatment generally consumes from three to six months for perfect results. Tarsal massage has been used at the Eye, Ear, Nose and Throat Hospital of New Orleans for years, and if Dimitry is correct it was thought there that certain astringents employed produced the results and not the tarsal manipulations, as advocated for the first time by him. The method has never been published by the above named institution.

Dimitry states that after an extended sojourn in the East, where he frequently visited many large eye hospitals and saw numerous cases of trachoma, he accepted at that time as superior the grattage method so highly advocated to-day. Its use in New Orleans, however, met with severe criticism at the hands of Dr. H. Dickson Bruns, who sternly objected to any technique that would produce scar tissue in what is already a scar tissue disease. Dimitry gives full credit here and now to Dr. Bruns for having stimulated in him a better method than the accepted grattage. Massage is by all means more logical and in every respect superior.

PREGNANCY AND DIABETES MELLITUS.

In the *Boston Medical and Surgical Journal* of December 2, 1915, JOSLIN says that it would seem the secret of success in the treatment of pregnant women with sugar in the urine is:

1. To have the patients under constant supervision throughout the course of the pregnancy and for some months after confinement.

2. Treatment should follow exactly the same methods which are employed in the treatment of the usual case of diabetes.

3. Even when sugar appears to a slight extent in pregnant women, it should be carefully watched and controlled by diet.

4. The advantages of a Cæsarian section should be borne in mind.

5. Whereas ether anesthesia may work well, it is probably not so safe as gas and oxygen. If ether should be used, as brief an anesthesia and as little ether as possible should be employed.

6. Finally, many statements occurring in the literature of pregnancy and diabetes must be revised. Pregnancy in diabetes does not demand immediate abortion, even if acidosis is present. If pregnant diabetic cases are suitably managed, they will very likely abort less frequently. It cannot yet be accepted as proven that pregnancy aggravates a diabetes. It is quite possible that the reason for a patient with diabetes becoming worse during pregnancy is simply due to the ingestion of an unusual quantity of food. Reliable data upon the carbohydrate tolerance of diabetic patients before and after pregnancy are not available, although Maase records a single such instance. Nursing is not contraindicated following confinement, for the diversion which it affords the patient may offset the extra demands thrown upon the metabolism. Too few data have been accumulated regarding the blood sugar of pregnant women to warrant conclusions. The same statement may be made about the alleged excessive weight of children of diabetic mothers. The next few years may show that pregnancy can take place in diabetic patients far more readily than has been supposed. It is certainly true that with the improvement in the treatment of diabetic patients, diabetic women will be less likely to avoid pregnancy.

ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

SACHS reaches these conclusions in the *Journal of the American Medical Association* of November 27, 1915:

Experience with artificial pneumothorax in the treatment of pulmonary tuberculosis is gradually modifying the sphere of its application. The trend is toward its use, regardless of stage, in all progressive cases (particularly with unilateral involvement) which fail, after sufficient trial, to respond to strict sanatorium regimen.

Complications incident to the employment of this method, the great importance of continuous strict observation and thorough clinical, laboratory and Roentgen study of each individual case, the rest periods essential after each reinflation, the inability of outlining in advance the time of reinflations—in short, the close dependence of each successive step in pneumothorax therapy on the varying condition of the patient—are all factors which call, in the majority of cases, in the interest of safety and best results, for hospital or sanatorium supervision, at least for a few months, of each individual case in which the method is

being applied. Close attention to every important detail of technique, as well as strict asepsis, is also less of a problem, under such conditions, regardless of the excellent results obtained by some observers, in dispensary and office practice.

The present tendency, grown out of experience, is toward greater conservatism in the selection of cases, a selection based on thorough preliminary study and full consideration of the possible effect of compression in the individual case. Conservatism needs to characterize each successive step in the gradual attainment and subsequent maintenance of a satisfactory compression, with avoidance of too frequent reinflations and excessive intrapleural pressure. This attitude is very important, with a method the application of which cannot be subject to rule but is dependent on the condition of each individual case.

Through improvement of various details of technique and greater conservatism of action, pneumothorax therapy is gradually finding its defined place in the treatment of cases of pulmonary tuberculosis which do not yield to other methods.

THE PREVENTION OF RELAPSE AFTER EMETINE.

The *British Medical Journal* of November 13, 1915, states that Dr. Nathan Barlow—who is the medical officer of a plantation at Cuyamel, Spanish Honduras—has attempted to determine the percentage of permanent cures of dysentery after various methods of treatment. He recognized that the cases to be used for statistical purposes must have been carefully examined and recorded, that not less than six months must have elapsed since the cessation of all treatment, and that the cases must be free from complications which might confuse the results. In particular, he, like others, had found that intestinal infection with flagellates, ciliates, or metazoa made the removal of the amebæ much more difficult. He was able to study 400 cases in the Charity Hospital in New Orleans, and 300 cases at Cuyamel. He found that only 18 of the cases in New Orleans and 40 of those at Cuyamel fulfilled all the conditions he had laid down.

The most important result of his inquiry appears to be that the initial treatment with emetine must be very thorough. The conclusion he draws from the examination of these 58 cases, which seems to have been most carefully carried out, is that about 80 per cent or more of cases of infection with entamœba histolytica remain free from relapse for seven months or more, if treated for at least ten days continuously and with not less than one grain daily of emetine. If treated for less than nine days relapse is, he considers, almost inevitable. This is in accordance with the experience of British authorities, who, we believe, advise that the initial period of treatment should be twelve days. The simultaneous administration of ipecacuanha does not diminish the number who relapse, but its subsequent administration does. He holds that a permanent cure is possible in a shorter time with emetine than with ipecacuanha.

Cases of hepatitis and liver abscess usually remain free from either intestinal or hepatic relapse, partly on account of the more thorough treatment they receive. The plan which he considers best can be carried out only with intelligent patients who are within reach of a competent laboratory worker. One grain (or more, for one or two days) is given daily for fifteen days, followed by 60 to 80 grains of ipecacuanha for from five to twenty days, according to whether intestinal irritation is produced or not. The bowels are cleansed by a saline at the beginning of treatment, and about every five days. If there is either diarrhea or colic, it is checked by opiates, usually paregoric, in small repeated doses, until comfort is obtained. If severe diarrhea is present, liquid diet and rest in bed are required until the symptoms improve, when a more nourishing diet and gentle exercise are allowed. On discharge the patient is instructed to return once each month for examination of a fresh stool obtained after a saline cathartic. If either amebæ (of any variety) or cysts of entamœba histolytica are found, the treatment is repeated. The advantages

he claims for this plan are—first, that if amebæ are actually found, patients will readily submit to a second treatment, while even intelligent patients might resent this second treatment merely as a prophylactic measure; secondly, he believes that when a patient is clinically well, and with merely a latent infection, the second course of treatment will usually result in a complete cure; and thirdly, he points out that the repeated examination of cases results in the accumulation of data which will make it possible to determine the dose and duration of treatment necessary for permanent cure, and is therefore of the highest scientific and practical value.

EXTRACT OF PITUITARY GLAND IN LABOR.

In the *New Zealand Medical Journal* for October, 1915, JAMIESON says that regarding its relative efficacy in primiparæ and multiparæ, extract of pituitary is in striking contrast to the scopolamine-morphine method of anesthesia, which, in his experience, is very useful in primiparæ, but of little value in multiparæ. In primiparæ the two methods of treatment may sometimes be advantageously combined. The opportunity of the restfulness gained by the narcotic may be taken to get a little extra vigor into the uterine contractions at the proper time by means of pituitary; and the hours of ordeal are thus made lighter and shorter.

The old-time indications for the use of forceps are considerably modified by the advent of pituitary extract. Perineal rigidity, small degrees of contraction of the pelvis, delay due to malposition, such as occipitoposterior, formerly calling for instrumental aid, may now frequently be overcome by the extract, though care must be exercised in its employment in such circumstances. Uterine inertia as an indication for forceps is now entirely eliminated.

In prepituitary days 28 per cent of Jamieson's cases were instrumental deliveries. Since he began using the drug he has used forceps in only 10 per cent. Such a reduction in mechanical intervention is in the highest degree desirable.

The extract facilitates separation of the placenta, and markedly diminishes hemorrhage during and after the third stage. This is most noticeable, and is a point of very great moment, as the character of the puerperium depends so greatly on the amount of blood lost. Unlike ergot, pituitary may be safely employed during the third stage, because it only enhances the vigor of the normal, physiological uterine contractions, and does not, like ergot, produce an abnormal form of contraction.

Apart from these three conspicuous benefits, it is worth while giving the extract for the sake of the undoubted well-being the patients experience after its use, which one notices in great contrast to the pallor and weakness so often seen after a chloroform and forceps delivery. It is of value also in preventing tympanites and retention of the urine. Its effect and merits are quickly appreciated by patients. So striking are the results to them that Jamieson understands it is known in his district by the not inapt soubriquet of "the doctor's blasting powder."

Of its usefulness as an agent for inducing labor Jamieson cannot speak, as he has not had occasion to try it for that purpose.

What are the disadvantages? For the proper cases there do not appear to be any. But the cases should be chosen with discretion. Jamieson's earliest experience stands as a warning that patients with flabby, dilated hearts are not suitable subjects. Again, eclamptics are bad subjects. It has been recommended to hasten the completion of labor in eclampsia. But the rise of blood-pressure consequent on the administration of pituitary extract may easily be imagined likely to precipitate convulsions in eclamptic toxemia. And Jamieson has actual experience to show that this is so.

Care must also be taken that pituitary is not used to overcome difficulties that cannot reasonably be expected to give way before uterine power. Its rash employment and use in obstructed labor are likely to give the gynecologist a great deal more repair work than he had before its invention. Jamieson's rule is never to inject it until the os is

practically at full dilation, or felt to be very readily dilatable. Used so, and with proper regard to the patient's constitutional condition, no ill can possibly result.

RECTAL ANESTHESIA IN THYROIDECTOMY.

LATHROP states in the *Pennsylvania Medical Journal* for November, 1915, that he has operated upon one hundred and eleven cases of goitre from June, 1914, to September 9, 1915, under this form of anesthesia, and from his experience with a large number of these operations, before adopting it, he is convinced that we have an ideal method, and one superior to that by inhalation. He believes:

1. It is most valuable in head and neck operations.

2. There is no fear, as is so often seen in the usual method.

3. The pulse and respiration as a rule remain near normal, or do not vary much from their condition when the operation was commenced. If rapid, as in hyperthyroidism, it remains rapid, but does not increase as when fear has added to the apprehension of the patient.

4. There is less tax on the lungs and kidneys.

5. Operations can be done without the knowledge of the patient, which is surely valuable, and must play some part in anoci-association, while Crile's technique can be carried out, if desired.

PITUITRIN IN SURGERY.

In the *Chicago Medical Record* for November, 1915, GRIFFITHS reaches these conclusions as to pituitrin in surgery:

1. The removal of the hemispheres in an animal does not arrest its power to execute the normal bodily movements under external stimulations, because these movements are dependent on functional structures situated in the base of the brain and in the spinal cord, and which the posterior pituitary body probably governs. It has been suggested that while the medulla oblongata is an important consociating organ, its centers receive impulses from and are controlled and coördinated by a posterior pituitary body. Unlike the anterior lobe, which is said to influence oxidation and metabolism, the posterior lobe is not necessary to life, since it is but a coördinating structure.

2. The pituitary body is very essential to life, and has a great influence upon growth and development, as well as upon metabolism.

3. The first dose of pituitrin lowers the blood-pressure, and the second tends to raise it.

4. Pituitrin stimulates the muscles of the heart, intestines, bladder, respiration, and general vitality of the patient, as well as the kidneys.

5. It is an important adjuvant in post-operative treatment of any surgical operation, properly administered, and lessens hemorrhage and shock as well.

6. If pituitrin is used, as suggested, no further treatment will be necessary in many cases. The mortality of operations will be lessened, and the patient will make a more rapid recovery.

TREATMENT OF SYPHILIS IN THE PRIMARY STAGE.

In the *New York State Journal of Medicine* for November, 1915, KEYES emphasizes what we have pointed out several times, namely, that the golden dream of Ehrlich, the therapia sterilisans magna, that was to cure every syphilitic by a single injection of salvarsan, has not been realized. It is doubtful whether syphilis can truly be aborted at any time after its generalization. Perhaps abortion is possible after the Wassermann reaction has become positive, and even after secondary somatic lesions have appeared. But the real opportunity to treat syphilis, so as to cure it, presents itself in those few days that intervene between the appearance of the chancre and the appearance of the Wassermann reaction.

Therefore, the first essential for the proper treatment of syphilis is an early diagnosis. This diagnosis is usually made through the discovery of the spirochæta pallida in the secretion of the lesion.

This insistence upon an early laboratory diagnosis runs counter to all the sober teachings of our forefathers. They maintained, very properly, that before the stigma of syphilis was placed upon the remaining days of a patient, the clinician must be certain in his diagnosis, beyond peradventure. But with the possession of salvarsan, and the possibility of a real cure of syphilis in these few flitting days before generalization of the disease, our whole attitude is changed. We must now make our diagnosis before these same secondary lesions appear.

Let the writer not seem to depend upon the spirochæta investigation alone. He would no more accept the diagnosis of syphilis upon a single unsupported finding of spirochætæ than upon a single unsupported Wassermann reaction. The laboratory can err quite as brilliantly as the clinic. The spirochæta diagnosis of chancre must be supported by clinical manifestations that suggest chancre. If there is doubt, or conflict, a section of the lesion should be excised for confirmatory diagnosis.

With the diagnosis thus established, what shall be our treatment? The writer submitted this question in the form of a circular letter to ten syphilologists in New York City. Their answers reveal the following opinions: Two of them do not use abortive treatment. The remaining eight employ it. Yet only one of those who do not attempt abortive treatment awaits the appearance of a positive serum reaction or of secondary lesions before beginning treatment. All the others begin treatment at the earliest possible moment, on the discovery of spirochætæ. Of those who attempt abortion of the disease, only two practice excision of the chancre. One employs neosalvarsan, the other old salvarsan.

The minimum number of doses of salvarsan is two, according to two gentlemen; four, according to one; five, according to three; and six, according to two. In other words, almost all insist upon at least four doses. The salvarsan is apparently always employed intravenously. The interval between injections is usually one week, with variations of a day or two. One gives five doses at two- or three-day intervals.

Two gentlemen employ Gennerich's treatment, which implies the use of mercurial injections with the salvarsan.

This treatment is described as follows by Fordyce, in the *Journal of Cutaneous Diseases,* November, 1914:

In primary syphilis, with a negative Wassermann reaction, give six injections of salvarsan with the following intervals: The first four every five days, the fifth after seven days, and the sixth after seven to eight days. Intramuscular injections of calomel, 0.05 to 0.07, are begun at the same time and continue until twelve to fifteen are given. This course usually suffices to sterilize the patient in the primary stage. In older cases of primary syphilis a second course of salvarsan may be needed.

Regulate the dose according to the body weight and condition of the patient, giving to men from 0.3 to 0.45 gm., and to women 0.15 to 0.3 gm. He never gives 0.6 gm., as he considers it near the toxic limit. He seldom uses neosalvarsan, except at times to women, or where a mild effect is desired.

After the completion of this first course of treatment every one of these gentlemen employs injections of mercury. The insoluble calomel, gray oil, or salicylate are employed by six, the soluble compounds by two (while two made no mention of the salt employed). Four gentlemen (perhaps five) give supplementary courses of salvarsan, even though the Wassermann reaction never becomes positive, and no lesion appears. The balance only employ mercury.

The duration of the subsequent course of treatment is not clearly stated in the answers to the writer's inquiry; but apparently it averages not longer than three months in most instances. (The writer prefers to continue at least a year.) Thereafter the cure is confirmed by the absence of symptoms and the negative Wassermann reaction. One repeats the blood test as often as once a month at first. Two are satisfied to let six months intervene. The last Wassermann reaction is made and the patient declared cured, at the end of one year by

two reporters, at the end of two years by two, at the end of three years by two, and at the end of four years by one.

It is not clear how many require a provocative injection of salvarsan or a Wassermann test upon the spinal fluid as part of the final evidence.

The writer has enumerated these opinions in detail in order to point out the striking similarity of opinion which they voice. They say, almost unanimously, that the treatment must be prompt; that we must depend upon the old, rather than the new, salvarsan; that the dose must be from 3 to 5 decigrams, rather than a larger one; that the injection must be made intravenously, and must be repeated a number of times; and that the treatment must be followed by a course of mercurial injections in order to insure the cure, and more particularly for the purpose of preventing relapses of syphilis in the nervous system in those patients who fail of a cure. While, finally, confirmation of our success is to be had by repeated Wassermann reactions made every few months, and continued for at least one year, or if the writer may consult his own preference, for two or three years followed by a provoked Wassermann, and the usual tests of spinal fluid.

With these conclusions the writer heartily concurs. The patient who is so treated may expect to be entirely relieved of his disease. The writer uses the word "expect" advisedly, for we have not yet lived long enough to be sure that even these cases are definitely cured. But we are in a position to state that they have nothing to lose by this treatment and everything to gain.

It has been feared that abortive treatment, by killing most of the spirochætæ in the patient's body, might inhibit his reaction to the disease and thereby encourage grave relapse.

This fear has been verified in the so-called "neuro-recidiv"—*i.e.*, syphilitic relapse in the nervous system occurring after the administration of salvarsan, following the outbreak of the secondary lesions. Such relapse in the nervous system is actually an outbreak of syphilitic lesions due to spirochætæ not eliminated by the salvarsan. It is not to be feared in patients who are treated before the Wassermann reaction becomes positive, nor indeed in any patient who follows the combined treatment with salvarsan and mercury, as suggested above.

The one type of relapse to be looked for after the employment of abortive treatment in the primary stage of the disease is a relapse of the chancre itself; this is likely to occur several months after the disappearance of the initial lesion. The new chancre appears on precisely the same spot where the old one was, for it is but a recrudescence of the latter. Its course is that of the original lesion: It begins as an eroded papule, where spirochætæ may be found; then the satellite glands enlarge, the Wassermann reaction becomes positive, the secondary septicemia ensues.

Such a relapse occurring several months after the disappearance of the original chancre, and at a time when the patient may consider himself cured of the original infection, may well have been preceded by a sexual contact and be considered a reinfection with syphilis. Yet the writer has seen one case follow this course without any sexual exposure, and others have noted the same phenomena. It is worthy of note, therefore, that the so-called reinfection with syphilis, a few months after abortive treatment, is likely to be nothing more than evidence that the treatment was not wholly successful.

The percentage of successes with abortive treatment we have no means of judging, for all of us have seen individuals remain apparently well for several years after an abortive treatment which we would nowadays consider insufficient.

Such patients seek permission to marry, and the prevailing opinion appears to be that the syphilitic may marry, if his Wassermann remains negative and he remains free from lesions for two years after the cessation of treatment. But we have not yet enough experience to settle this question absolutely. The writer feels safe for the present in adhering to the old rule of five years from chancre to matrimony.

Keyes concludes that:

1. Diagnosis of syphilis before Wassermann reaction becomes positive is the foundation of abortive treatment.

2. Abortive treatment consists of repeated intravenous injections of old salvarsan, followed by injections of mercury.

3. The success of abortive treatment must be verified by repeated blood examinations, finishing with a provoked Wassermann and the spinal fluid tests.

4. The failure of abortive treatment may be shown by a succession of symptoms exactly simulating reinfection with syphilis.

THE MIDWIFE PROBLEM.

PAINE contributes to the *Boston Medical and Surgical Journal* of November 18, 1915, a paper on this subject and states that from his study of the various facts and opinions presented, the following conclusions may be reasonably drawn:

1. Education in obstetrics in the various medical institutions in this country is considerably below the standards achieved in other branches of medicine.

2. The practice of obstetrics generally is very materially below the standards of general medicine and surgery, due, first, to the educational deficiency in this subject; secondly, to a low type of midwife service, the result of a practical absence of regulation; and thirdly, to the fact that the general attitude of the public at large toward the practice of obstetrics is not in keeping with the dignity of that subject.

3. No comprehensive and far-seeing plan is generally being developed to cope with the situation as it presents itself.

4. There is a distinct tendency in many quarters to adopt the midwife as an institution after the manner of its conduct in the countries of Europe.

5. While the whole subject of the proper obstetric care of patients needing this service is one of great economic importance to the State, there is practically no attempt at meeting this situation by the State.

6. It would seem that our method of government is not adapted to the rigid requirements which the properly regulated midwife demands.

7. The State should assume the management and control of this work, which is of the greatest economic importance, as readily and as well as it assumes the burden of caring for such of its citizens as are incapacitated by ill health or age.

POISONING BY MERCURIC CHLORIDE AND ITS TREATMENT.

In the *Archives of Internal Medicine* of November 15, 1915, LAMBERT and PATTERSON tell us that the treatment, as it is formulated by them at present for cases coming under observation early, is as follows:

The first indication is to give the patient the whites of several eggs and then to wash out the stomach thoroughly. This has usually been done before the patients are admitted to the hospital. On admission, the stomach contents are expressed and examined for mercury, the stomach is thoroughly washed, and a pint of milk introduced. If no stomach contents are obtained before lavage, then the lavage water is examined for mercury. Urine passed spontaneously, or that obtained by catheter, is examined for mercury. The metal appears in the urine in from three to twenty-four hours after it has been swallowed. If more than a day has elapsed since the poisoning occurred, a stool should also be examined for the poison. If the first lavage does not allay the nausea and vomiting, it is repeated after an hour, and the following routine is begun as soon as the stomach will permit:

1. The patient is given every other hour 8 ounces of the following mixture: Potassium bitartrate. 1 drachm; sugar, 1 drachm; lactose, one-half ounce; lemon juice, 1 ounce; boiled water, 16 ounces. Eight ounces of milk are administered every alternate hour.

2. The drop method of rectal irrigation with a solution of potassium acetate, a drachm to the pint, is given continuously. The amounts of urine secreted under this treatment are very large. In one case 269 ounces were passed in twenty-four hours on the fourteenth day of treatment.

3. The stomach is washed out twice daily.

4. The colon is irrigated twice daily, in order to wash out whatever poison has been eliminated in that way.

5. The patient is given a daily sweat in a hot pack.

It is imperative to emphasize the necessity of keeping up the treatment with the colonic drip enteroclysis day and night without interruption. It entails discomfort for the patient, but the victims of accidental poisoning are always willing to do anything to recover from their plight, and the attempted suicide usually repents rapidly of his error, and the hope of his life being saved stimulates his patience and desire to coöperate.

PYELITIS: ITS CLINICAL SIGNIFICANCE.

In the *New York State Journal of Medicine* for November, 1915, WYNKOOP deals with this important but overlooked subject. He points out that pyelitis, though occurring more often in girls, occurs frequently in boys, especially at the nursing period. Look carefully into so-called cases of intestinal colic, with low temperature, slight abdominal pain, or with frequent urination, occurring in male babies.

Failure to gain in weight and occasional temperature of 101°-102° in the evening, with normal temperature most of the day and variable appetite, may not be due entirely to intestinal disturbance.

Bear in mind the fact that such a condition as pyelitis can exist, and always expect it when the symptoms assume an indefinite character.

Many cases are recorded in which all clinical signs have escaped detection until a careful urinary analysis was made.

In these cases if fever, pain, anemia, frequent or painful urination occurred, the symptoms were so slight as to escape notice.

Therefore the writer's warning is, in all cases, whether male or female infants, showing that there is some hidden focus somewhere that is causing trouble, think of pyelitis, though the typical symptoms may be absent.

In every case of intestinal colic in a nursing baby think of the possibility of a pyelitis. In low fever with indefinite symptoms watch the urine constantly.

Therefore the writer would again warn us to make complete and thorough urinary analysis in all cases, a practice which is too often neglected.

By strict attention these mild attacks of bowel disturbance, with a little fever, that seem to arrive from no cause whatever, may prove to be pyelitis. In cases of abdominal pain, although even very slight, realize that there are other organs besides the stomach and intestines that may cause trouble.

A review of pediatric literature does not contain as many references to pyelitis as it would seem to warrant.

Most authors mention it as a cystitis, cyst-pyelitis, pyelonephritis, but from personal experience it seems as though this disease should receive more attention than it has, for, as experience comes with years, so does the practical recognition of the prevalence of pyelitis far in excess of what we have been taught to believe possible.

The treatment will be mentioned briefly. Urotropin and potassium citrate are probably the most used remedies. In Wynkoop's experience potassium citrate has been more effective than urotropin. Plenty of water must be given the patient, and it is also desirable to render the urine alkaline. [This contradicts views generally held.—ED.]

A warning is here again issued that relapses are common, especially in long-continued, unrecognized cases, and the severity of the symptoms may be astonishing. Attention, however, to every detail of right living, that is so often neglected in these children, together with proper medication, will usually finally effect a cure.

It has often been a source of serious concern to see these little ones who have suffered from the ravages of an unchecked pyelitis, present themselves in an emaciated and almost hectic condition.

Wynkoop warns us in regard to treatment. We should not neglect the general hygienic measures that are so important to

improve the child's resistance. All measures may fail if we overlook a chronic constipation, improper diet, or lack of sufficient fluids in the system.

Tonics are of use in certain cases. So far the vaccines have not proved to be as effective as hoped for.

In presenting this paper, the points that seem to the writer to be most important are these:

First, pyelitis is without doubt a much more common disease than was formerly supposed.

Second, its occurrence in male babies is much more frequent than is usually considered possible.

Third, its symptoms are, in mild and atypical cases, easily overlooked.

Fourth, in all diseases of infancy and childhood frequent and complete chemical and microscopic examinations of the urine should be made.

Fifth, in a condition which presents unexplainable symptoms, always think of the possibility of a pyelitis.

Sixth, treatment has to be persisted in for a long time, as pus will be present in the urine, as a rule, after all clinical symptoms have subsided.

Seventh, relapses are very common, and oftentimes these cases are very stubborn in yielding to treatment.

OVARIAN TRANSPLANTATION.

FRANKLIN MARTIN (*Surgery, Gynecology and Obstetrics,* November, 1915) concludes an admirable résumé of this subject as follows:

Careful sifting of the accumulated literature of ovarian-tissue transplantation leaves a feeling of disappointment as to its surgical value in the mind of an impartial observer.

Autotransplantation of ovarian tissue, as the operation is at present practiced, retards and modifies the symptoms of the artificial menopause that is precipitated by castration in a definite number of cases, depending undoubtedly upon the ability of the graft to retain its vitality in the new environment.

The percentage of successful results in the autotransplant seems to be as large where the simplest technique is employed, using small pieces of ovaries tucked into pockets of well-vascularized tissue, as when a more complicated technique is employed with an attempt to definitely couple up the blood-vessels.

The fact that homotransplants and heterotransplants are failures, made with the same technique that is employed for successful autotransplants, demonstrates that there is a definite antagonism between the tissues of different species.

Occasional reports of successful homotransplants and heterotransplants encourage one to hope that in some way this antagonism of tissue will be overcome, and more successful work may result because of the greater precision this would make possible in selecting more normal tissue.

In this relation Vineburg's study of the fate of ovaries after hysterectomy is of interest. He notes that there is still considerable uncertainty as to which tissue in the ovary is responsible for the production of the "internal secretion."

While it is established that the follicles go through the various stages of development in the conserved ovary or ovaries after the uterus has been removed, it is not at all certain that the function of the internal secretion continues uninfluenced by the great changes in the blood supply, and by the traumatism to which the pelvic sympathetic nerves are subjected as a consequence of the operation.

It is still a disputed point as to what degree the climacteric syndrome is due to the removal of the ovaries, and to what degree to the injury to the pelvic nerves incident to the operation.

Clinically it has been found that the freedom from the climacteric syndrome in hysterectomized women, in whom the ovaries have been conserved, is only relative to that which obtains in the same class of women in whom the ovaries have been removed. A generous estimate would be 20 per cent in favor of the former.

To obtain the benefits claimed by the advocates of conservation the ovaries should

be retained at all ages and not limited to those under forty-five years, as it has been shown that of the women who suffered most severely from the artificial menopause 23 per cent were over forty-five years of age.

Subsequent disease of the conserved ovary, such as cystic degeneration, malignant growth, inflammatory processes leading to adhesions, and pain calling for a second operation, does occur in some cases, the number, no doubt, being much larger than would be inferred from the records found in the literature.

In view of the foregoing conclusions the writer is of the opinion that the doubtful clinical advantages accruing from retaining the ovaries in hysterectomy are more than counterbalanced by the risks to which the patient is subjected from subsequent disease and adhesions of the conserved ovaries. The writer would therefore not retain the ovaries in any case of hysterectomy, unless he could leave enough of the lower segment of the uterus with its endometrium to insure the function of menstruation (Zweifel's method). For in his experience the knowledge imparted to the woman that her ovaries have not been removed has little significance or moral effect, when she learns that she will no longer menstruate.

GAS POISONING.

HILL (*British Medical Journal*, Dec. 4, 1915) notes that Lehmann long since showed that if gases are to be used in warfare they would be chlorine or bromine.

We are told that a typical case on admission is cold, with a subnormal temperature, conscious but restless, with pulse slow and full (except in the collapsed cases). The face is cyanosed, intensely so in many cases, and the expression strained and anxious. The posture varies. In some cases the patient sits propped up, with head thrown back, gasping for breath; in others, he lies on his side, with his head over the edge of the stretcher in an attempt to aid expectoration. The respirations are jerky and hurried, often numbering 40 to a minute, and are associated with a choking cough, accompanied by a varying amount of frothy expectoration. With each inspiration the chest is expanded to its fullest, all the auxiliary muscles being brought into play just as in an asthmatical paroxysm.

This is the first or asphyxial stage, which, if the patient survives, gradually passes off after some thirty-six hours. Can we wonder that such long-lasting, intense dyspnea should produce nephritis, accompanied as it is with convulsive breathing, which just maintains the cerebral circulation within viable conditions at the expense of the abdominal circulation? Major Broadbent records a case in which he believes a cusp of the aortic valve was ruptured in the struggles for breath.

"After the first stage the patient falls into a sleep, and awakes feeling much better. But after a few hours of comparative quiet symptoms of bronchitis begin to manifest themselves. In the majority of cases these are not severe"—because, no doubt, nearly all the severe cases die in the first stage. "In the cases which are kept alive with difficulty there is a short, quiescent stage followed by intense bronchitis. The frothing gives place to greenish mucopurulent expectoration, consciousness to delirium, the temperature rises from subnormal up to 104° F., the pulse becomes of small volume, with its rate increased perhaps to 160, the respirations are less choking but more shallow, and number up to 70 per minute before death."

As to treatment in severe cases of chlorine poisoning, the one object must be that of getting rid of the exudation in the air tubes which is drowning the victim. Artificial respiration and insufflation may, therefore, be useful. Emetics are serviceable, as by the act of vomiting the lungs are freed from the liquid. The administration of oxygen relieves the cyanosis and improves the condition of the patient. Atropine is useless.

The author concludes with the statement that the chlorine poisoning of the lungs is comparable to extensive burns of the skin, and the same general treatment to support

strength and lessen shock is required. Just as septic infection of the skin is the sequel of the burn, so pneumonia and bronchitis follow chlorine poisoning. In their experimental animals severe poisoning had in every case that end, and they know of no means of preventing it. Warmth and good nursing may pull a man through; those conditions are difficult to apply to animals.

DUODENAL ULCER FROM A SURGICAL STANDPOINT.

LAMBERT (*Surgery, Gynecology and Obstetrics,* November, 1915) quotes Wilkie to the effect that the duodenal wall in many instances is supplied by what is truly an end artery, and it can be readily understood that this relative limitation of the blood supply would interfere with the healing of any lesion in this region.

Induration of these ulcers in the majority of cases prevents excision, but even if excised such treatment does not eliminate hyperacidity, and so a gastrojejunostomy must supplement the excision. If the latter is efficient practically no food leaves the stomach, and so pyloric exclusion is unnecessary. In the ordinary case, and especially when undertaken for hemorrhage, the procedure appealing to the author is autolytic excision by means of the pentagonal compression stitch of Draper and Carpenter, combined with a posterior gastrojejunostomy.

The most striking complication of duodenal ulcer is acute perforation, of which 14 cases are reported. Analysis of these cases shows that the most characteristic feature is the onset of sudden overwhelming pain in the upper abdomen. Vomiting is not marked. The temperature and pulse are low at first, but later the pulse tends to rise. The respiratory movements are restrained and the patient looks ill. Rigidity is the most important factor in diagnosis; from the first it is present all over the abdomen, but early more marked on the right than on the left side. The presence of movable dulness and loss of liver dulness are relatively unimportant.

Perforation must be differentiated from (1) acute pancreatitis, in which there is often cyanosis, and in which vomiting is more persistent and abdominal rigidity more marked; (2) appendicitis, in which rigidity is more marked in the right iliac fossa; (3) strangulation of the bowel, which is characterized by persistent vomiting, paroxysmal pain, distention, and absence of rigidity; and (4) ruptured ectopic pregnancy, in which rigidity is absent and in which hemorrhage soon clears up the diagnosis.

The treatment is immediate laparotomy, the operation never being delayed in the hope that the patient will rally from the shock. This should be combated by the immediate administration of a full dose of morphine. In only one of the 14 cases was the ulcer suitable for excision. In the others a deep compression stitch was placed and a posterior gastrojejunostomy by the no-loop method was done, the anastomosis being placed as near the pylorus and greater curvature as possible. The abdominal wound was closed without drainage and no secondary abscesses developed.

DISINFECTION OF SEPTIC JOINTS.

COTTON (*Boston Medical and Surgical Journal,* Dec. 16, 1915) observes that infected joints have always been a reproach to our art; their treatment the counsel of despair.

A suppurating joint, infected from without or from within, has been counted among the lost, and not only joints, but lives—many lives—have been lost as well. Nothing could be worse than the story of joint drainage. To-day the opening and drainage of joints should be listed not as an operation but as a crime. It is our duty to-day either to determine and declare a joint infection hopeless, and then to lay the joint wide open (not drain it), or else to bend all our efforts to an optimistic attempt to save the joint; not only to get it healed, but to preserve its function as well.

He learned purely empirically that gonococcal joints if opened do much better when sewed up tightly than when drained.

Shortly after this he encountered some really septic joints, particularly staphylococcic and some streptococcic, and these he treated in the same way, sewing the capsule tight and gradually evolving an antiseptic technique. This consists in opening of the joint and irrigation for fifteen minutes (by the watch) with a full stream of 1:15,000 corrosive sublimate; a flushing-out of the excess with salt solution; then a water-tight closure of the capsule by mattress and single sutures in such a way as to leave the synovial membrane cut edge to cut edge, as accurately as may be.

The external wound is left wide open or nearly so, since real disinfection of the external soft tissues is not practicable. After operation there may or may not be an effusion into the joint; if an effusion comes it goes again within one to three days, and is not accompanied by temperature or by any considerable discomfort.

Traction is usually unnecessary for the separation of joint surfaces. Cotton states that in about two dozen cases thus treated, excluding the gonococcus ones, not less than 15 of them representing infections of staphylococci or streptococci, there were but two failures, one a punctured wound of the knee in a male adult treated according to the above technique and laid wide open, the patella laid back on the thigh. Later (after vaccine treatment) subjected to a cleaning out of granulations of nearly intact cartilage and suture of divided ligaments, he obtained in the end a good leg with 45 to 50 degrees of motion. The second failure was in a boy of three suffering from an epiphyseal staphylococcic infection. The joint was flushed out and sutured. It broke down and ankylosis resulted.

DEEP-SEATED ALVEOLAR INFECTIONS.

RHEIN (*Surgery, Gynecology and Obstetrics,* January, 1916) observes that in studying the dental path as an avenue of general infection it is of the utmost importance to disassociate what is known as pyorrhea alveolaris from either an ordinary alveolar abscess or its more insidious and dangerous type—an infected zone around the end of a root with no pus formation and no sinus, and known as a dental granuloma. The etiology of these two pathogenic conditions is so divergent that they must be considered from entirely different viewpoints. The fact that in both medical and dental gatherings they are discussed so frequently as though they belonged to the same type of infection is due to the lamentable weakness in the medical curriculum on general pathology.

The dental student is wofully ignorant of everything pertaining to the body outside of the dental organs. Nevertheless, he treats pathogenic conditions that have the closest relationship with every important organ. The medical student is taught the anatomy, histology, physiology, and pathology of every part of the body except what may be termed the dental organs. The portal of entry to the digestive tract and the portal of entry for the great mass of pathogenic organisms remain a sealed book to the medical student instead of being viewed as one of the most important studies necessary for a proper understanding of infections. Stomatologists, who with a thorough medical education, however acquired, have made a special study of the dental organs, are the only men whose opinion on these topics should have any recognized value.

In the eyes of the stomatologist the recent work of Bass on this subject is so full of error as to command very little respect. Instead of pyorrhea alveolaris being so common, it is very uncommon and only found after some form of malnutrition has proceeded far enough to destroy the immunity of this end organ tissue.

Many cases of alveolar abscess are erroneously diagnosed as pyorrhea alveolaris. This grave error was much more common before the advent of röentgenology. It has been found that the toxemia resulting from a dental granuloma is far greater than from a pyorrheal discharge. Statistics show that while the death-rate in infancy, adolescence, and early middle life has been steadily de-

creasing, year by year, on the other hand from maturity to old age, until last year, the death-rate from diseases of the heart, blood-vessels, kidneys, etc., has practically doubled in the United States in the past thirty years. Forty years ago the dentists in the United States did very little tampering with the pulp of a tooth. It was the rule to practice extraction as soon as there was pulp involvement.

During this period there was a remarkable advance in what may be termed the technical art of dentistry. Each step in this artistic and mechanical advance brought with it less respect, less fear of consequences of preserving in the jaws teeth in which the pulps were devitalized. The conscientious dentist felt that the acme of professional service had been reached when after the pulp had been removed the tooth remained in the jaw without giving any discomfort. Bacteriology twenty years ago had not revealed to us the presence of streptococcus viridans around the ends of the roots of teeth and the fact that it could be present without causing the slightest irritation.

A strongly circumstantial point of clinical evidence to substantiate the fact of the increase in mortality being due to faulty dentistry is found in the fact that in Great Britain during this period there has been at this advanced age a slight decrease in mortality. This appears to be due to the comparatively small amount of bridge work and the extensive extraction of teeth practiced in the British Isles.

Professor Hartzell has very lucidly described the great abundance of streptococcus viridans around the teeth and the ease with which they can pass through the gingival crevice, and then through well-defined channels reach the alveolar structure. His own research work shows us that these microörganisms appear to be constantly traveling about these regions. They appear to do no harm until they congregate in such quantity as to produce a distinct nidus of infection. The remarkable vitality of the dental pulp is shown in the fact that in about 50 per cent of cases where attempted devitalization takes place, the apical end may retain its vitality. In such cases periapical infection in the shape of a dental granuloma never takes place. Where, however, the pulp-tissue is devitalized entirely, infection at the point of the foraminal opening into the alveolar tissue is the invariable result unless correct therapy is followed out.

Research work on pulpless teeth developed the fact that as long as the openings at the ends of the roots through which the pulp with its circulation gained entrance remained unsealed, infection from streptococcus viridans was not only possible but most probable. Roentgenographs demonstrated the fact that the root-canals could be perfectly cleansed and filled close to the apex of the root and still infection would follow unless the outer end of the root was sealed in such a way that wandering streptococci could find there no resting-place.

It was discovered and proved that if the pulp contents were absolutely removed, and any pathogenic tissue present eradicated, and the canals hermetically sealed in such a manner that the sealing material was forced through the apical orifices, thus obliterating them, no infection would ensue.

Roentgenology has proved the correctness of this therapy in showing alveolar regeneration where this operation has been performed thoroughly with all necessary aseptic precautions. This operation is, however, not an easy one. It consumes a great deal of time and requires infinite skill combined with patience on the part of the operator.

Wherever the roentgenograph does not show the periapical end of the root-canal to be absolutely sealed, the operation must be considered a failure. Wherever this operation cannot be successfully performed the tooth should be immediately extracted, or the unfilled portion of the root be removed by an apicoectomy.

In the city of New York a large number of dentists have adopted this technique, and the statistics of New York State for the past two years begin to show a decreasing mortality in those of advanced life. Amer-

ican dentistry has once more shown its superiority in meeting this problem and being able to save about 90 per cent of pulpless teeth in such a manner that reinfection of this area is unlikely.

TREATMENT OF GUNSHOT WOUNDS OF THE ABDOMEN.

MAYO ROBSON (*British Medical Journal*, Dec. 4, 1915), who served in the Dardanelles from June to the end of October, after "some little experience" of cases treated by opium, starvation, and rest, concluded that something more could be done, since a very large proportion, especially of the shrapnel shell wounds, ended badly. Judgment must be exercised as to the class of cases in which it is wise to operate; for instance, a clean bullet wound through the abdomen, with small wounds of entry and exit, and without evidences of internal hemorrhage or extravasation, may, if favorably situated, be treated expectantly; whereas a bullet wound with large openings of entry and exit, or with absence of liver dulness, should be operated on as soon as possible if seen early and if the general condition is favorable.

As nearly all shrapnel, shell, and bomb wounds are septic and produce great visceral injury, operation will give a better chance of success than expectant treatment if the patient is in a fit condition to bear it and the case is seen early. If the case is seen late and peritonitis has already set in, a small incision above the pubes large enough for the insertion of a drainage-tube down to the bottom of the pelvis, and the Fowler position, will give the patient a chance of recovery.

This treatment, by the way, is the best for typhoid perforation; Robson having learned this in France, where, in the large typhoid hospitals, a good proportion of cases are being saved.

Among the cases he treated was a shell wound of the abdomen tearing the anterior wall of the stomach. The patient recovered. So, too, did a patient with a penetrating wound of the right side of the abdomen with a tear of a large mesenteric vessel, which was ligated; and one with a shrapnel wound low down in the cecal region (the cecum being closed by silk sutures); likewise a patient with a bullet wound through the right side of the abdomen below the costal margin recovered, though liver dulness was absent and there was effusion into the right lung. Wounds of the colon and duodenum were closed by purse-string sutures. Another patient had a bullet wound of the epigastrium with free blood in the abdominal cavity from the mesocolon, stomach, liver, and pancreas. The latter was bleeding freely. The bleeding points were secured, the stomach wounds were sutured. Also a case of bladder wound recovered. A case with a shrapnel wound beneath the left costal margin, attended by free bleeding and wounds of the small intestine, died.

COMPLICATIONS IN CONNECTION WITH THE URETERAL STUMP AFTER NEPHRECTOMY.

Although there are other causes, states VERRIOTIS (*Zeitschr. f. Urologie*, V. 9, No. 7, 1915), that will give rise to fistulæ besides the ureteral stump, when these cases are critically examined, especially those cases in which there is a relationship between the stump and the operated wound, it will be found that the stump is the cause of the fistula. Heitz-Boyer and Morenno have shown by means of Beck's paste that the fistula is in close connection with the stump of the ureter. There is no agreement, however, between the development and the degree of renal tuberculosis and the degree of ureteral tuberculosis. A kidney only slightly involved by tubercular disease may have a ureter with very far advanced tuberculosis, and *vice versa*. Such fistulæ may be divided into two classes: (1) Fistulæ occasioned by the stump, but that are only connected with the wound; (2) fistulæ connected by means of the stump both with the bladder and the wound. In the former the fistula is pustular, in the latter the secretion contains urine and pus.

Fistula may make its appearance either after the nephrectomy or after cicatrization of the wound. In the latter case a swelling, diffusely red, appears in the scar, which after a short time shows vesicular elevations. These break open, and from the openings thus created a yellowish pus exudes. In some cases the pus is more fluid and has an ammoniacal odor. In these cases there is urine admixed with the pus.

In other instances the patient leaves the hospital with a perfectly healed scar, and after a time returns with symptoms of acute phlegmon. On examination a diffuse edematous swelling will be found in the region of the ureter. These cases may have the development of a cold abscess, in which event the symptoms are less pronounced. In other cases the patient complains of severe pain on the operated side. At the time of the pain the temperature rises and the urine, which has been cloudy, may become quite clear. As soon as the pus reappears in the urine the pain disappears. This is a picture of unilateral intermittent pyonephrosis, but this diagnosis should not be considered because the patient has but one kidney and this passes clear urine during the crisis. The symptomatology shows a pustular process in the ureteral stump. It is intermittent pyoureter. It happens in those cases in which the ureter is thick and dilated. The lesions in the ureter may not all be of the same age. In one part of the ureter the lesions may be young, while in another part they may be far more advanced. Usually the upshot of the process is the formation of a cold abscess, provided there is no mixed infection. If the condition follows a more acute course, mixed infection should be suspected, and it should always be borne in mind that these abscesses may evacuate into the visceral organs.

In some cases the wound remains perfectly cicatrized and shows nothing abnormal. But the patient continues to pass pus in his urine, with or without the presence of tubercle bacilli. In other cases pus in the urine appears after a period of apparent improvement. These symptoms need not necessarily excite suspicion of tuberculosis of the remaining kidney, because they may be occasioned by the ureteral stump, which becomes diseased. Where the patient, after the nephrectomy, shows perfectly clear urine and then develops pyuria, it may be assumed that at the time of the nephrectomy the ureteral lesions were still in their earliest stages (initial infiltration, granulations), and that since the operation these lesions had developed, accounting for the appearance of pus in the urine. In such instances cystoscopy is of importance because it will show the source of the pus.

In regard to technique, Verriotis says that it makes little difference whether total or partial ureterectomy is practiced, because in either instance fistulæ occur in 10 per cent of cases. He believes, however, that the complication of fistulæ may be materially restricted if drainage is avoided through the wound—that is, the three following points should be adhered to: (1) lateral subperitoneal extracapsular nephrectomy; (2) suture of the wound; (3) lumbar drainage independent of the wound. —*Urologic and Cutaneous Review,* December, 1915.

EARLY DISINFECTION OF WAR INJURIES.

TUFFIER (*Surgery, Gynecology and Obstetrics,* January, 1916) states that the importance of early disinfection of wounds is not sufficiently realized. Of 1000 amputations 75 per cent were due to the long duration of the treatment of wounds and their late complications, such as neuritis, osteitis, and vicious scars. Disinfection after the first forty-eight hours is practically impossible, but disinfection within the first few hours is very effective.

The number of bacteria in a wound and their diffusion through the tissues are in proportion to the length of time that has passed since the wound was made. As early as the Russo-Turkish war of 1877, Rehyer showed that in injury of a joint there was a mortality of only 13 per cent in the cases treated during the first twelve hours, while

among those treated later the mortality was 61.5 per cent. The same thing was true of compound fractures, the mortality rising after the first twelve hours from 18.1 to 35.3 per cent.

The action of the antiseptics in use at present has been shown to be unsatisfactory. From his recent research work Wright thinks that hypertonic salt solution is the best, because of its osmotic action on certain elements of the serum, but it is powerless against the streptococcus. Tuffier believes that the best antiseptic to use is hypochlorite of soda by Dakin's method.

All wounds should be disinfected at the dressing station or at the stationary ambulances, which are from 5 to 20 kilometers back from the firing line. At the dressing stations the skin is disinfected with ordinary petroleum, the superficial or easily accessible parts of the wound cleansed, and a compress of Dakin's solution applied and bandaged loosely. The wounded limb is immobilized. The line of stationary ambulances should form a barrier beyond which no infected case should be allowed to pass. The wounded should arrive there within twelve hours after being wounded, and the wounds be completely disinfected. It is very dangerous to send an infected case farther, and perfectly safe to send the patient on after immobilization and complete disinfection of the wound.

The technique is as follows: Combat shock, though no really satisfactory means is yet known for doing this. Take a radiogram to show the site of projectiles and the nature of fractures. Give ether anesthesia if there is no contraindication. Cleanse the skin and apply tincture of iodine, protecting the wound. The wound is then irrigated thoroughly with hypochlorite of soda, and the surgeon explores it very carefully with his finger or a probe; all foreign bodies and bone fragments are removed very carefully so as not to injure sound tissue. Any necessary incisions are made with care and only necrotic tissue removed. After the wound has been cleansed in this way several rubber tubes are inserted into its deepest recesses. If it is necessary in order to hold the wound open tampons of cotton wet with Dakin's solution are put in around the tubes. Sterile cotton is put all around the wound and the limb very loosely bandaged, the rubber tubes projecting out through all the dressings. Every hour 5 to 10 Cc. of Dakin's fluid is poured into the tubes. The cotton is changed every day. A clear liquid is discharged from the wound at first, but there is no odor or suppuration. The temperature generally falls to normal within forty-eight hours. Tuffier intends to publish the statistics of his cases treated in this way soon. When the temperature has been normal for a few days and the wound is in perfect condition it is allowed to close up.

THE EXAMINATION, PREPARATION, AND CARE OF SURGICAL PATIENTS.

CHARLES H. MAYO (*The Journal-Lancet*, Jan. 1, 1916) states that the rapid advances made in medicine during the past three decades have necessitated many changes in the methods of general examination of surgical patients, and also in their preparation and after-care. Reviewing this period in the general practice of medicine and surgery, it appears that the methods which have survived are few and simple in principle and application, as compared with the original methods. This includes all antiseptic surgery.

In medical practice there has been almost a revolution in variety and principles since we have come to understand bacteria and the diseases produced by them. We now know that most diseases arise from infection; and the acute condition or the late results of it are being treated. Briefly, the newer medicine is the understanding of the varying stages of the processes of infection, of the increased or lowered body-resistance, as well as searching for the local focus and aiding in its elimination. In this connection, dentistry and diseases of the nose and throat have received much attention in the study of local foci of infections.

In regard to the patient: As a profession we are probably less acute in our general

observation than was the practitioner of the old school. In his day everything depended on observation, and apparently no little thing was overlooked, whereas we are supported by many laboratories of special investigation. While it is possible in the present day to acquire a general survey of the practice of medicine in its various branches, it is wholly impossible for a physician to practice, and to apply unaided, the principles of the various laboratories and recognized specialties. For example, we are as dependent as ever on tests of the urine. Reports of albumin and casts, while intimating diseased kidneys, do not prove them essentially diseased, but lead the physician to search for the irritant in an acute or chronic infection, and to regard the kidney as an overworked eliminating organ; therefore, tests of renal efficiency have been developed.

Blood examinations are not considered as infallible indications of special disease as they formerly were, but the count, character, and color-index of the cells are of great value. Blood smears and cultures are proving necessary to identify obscure infective conditions.

Laboratories for the study of bacteria, the preparation of vaccines and serums, and the examination of intestinal secretions, are also of increasing value. Intestinal parasites and bacteria often are found the cause of obscure general diseases other than the well-known tropical varieties. In the laboratories of research the specific effects of bacteria on animals in a study of the causes of obscure diseases are most important.

Radiography is invaluable in the diagnosis of diseases of the alimentary tract, diseases and fractures of bones, diseases of the lungs, kidneys, ureter, and bladder, and in locating foreign bodies, stones, etc. Radiography has the disadvantage of apparently being always correct in its evidence, and, even when contrary to the clinical findings, it is too often accepted as correct. Seldom, however, should a single, even though important, factor be taken to represent the true condition, but rather a detailed study of the various essential organs of the body should be made. The body has a natural tendency to recover from disease. This is fortunate, since we are constantly overlooking conditions of which timely discovery would save much suffering and possibly life.

The electrocardiograph is of value in designating patients with heart-muscle changes who may die suddenly during the first few weeks following operation, from fibrillation instead of embolism, as is often stated. The blood-pressure is also of value in showing the elasticity of the cardiac muscle and blood-vessels. Too much attention is paid to a high systolic pressure alone; it is the relationship of the systolic and diastolic which gives the clue to the condition. Diastolic pressure above 110, or higher, is of great importance in influencing the judgment of the surgeon. A high blood-count may mean diminution of fluid. This should be corrected if possible. Transfusion of blood before operation is rarely resorted to, but in extreme anemia from recent loss of blood, either directly after operation or in delayed accidental hemorrhages, shock is greatly relieved by the direct transference of blood to the patient. There are many methods of transfusion, the former direct methods giving way to the indirect, which are now simple and safe, and permit the transference of a measured quantity of blood. Hemolysis is a factor to be considered, and, unless the urgency is great, should be tested between the donor and the recipient.

The key-note of progress in the twentieth century is system and organization—in other words, "team-work." This factor has been very noticeable in the medical progress of Germany, where true diagnostic hospitals have been established. Such hospitals conducted by the State through the medical department of its university would be of enormous value to the public and the medical profession in this country. Patients from all over the State could be sent by their home physicians to this hospital for diagnosis in rare, obscure, and complicated diseases. From these institutions patients could be returned to their home physicians for medical or surgical care, with recom-

mendations for such care, or be sent to special sanatoriums, or medical or surgical hospitals, as indicated. If returned to the home physician, included in the report of the case should be sent references to the latest literature on the subject and information of where such could be procured. Unquestionably, the appropriation for such an institution would readily be obtained if the public but understood the value and saving to the State which would come from the prevention and cure of disease. There is no general estimate on the value of human life as compared with the value of animals, consequently these facts are slower in being generally appreciated from a purely monetary standpoint.

The starvation diet in the preparation of surgical patients has long been abandoned, the dangers of acidosis being nearly as great in starvation as in diabetes. The diabetics are accepted as a risk, and, except in emergencies, are always given preliminary treatment for their general condition, endeavoring to maintain the alkalinity at a high standpoint. The condition of children is improved by sugar and other glucose foods.

It should not be forgotten that treatment aids many patients more effectively before operation than after. Those who are suffering from starvation, loss of blood due to acute or delayed obstruction of the alimentary tract, should have a two-stage operation when possible. For example, in a case of pyloric tumor with obstruction, the body fluids should first be restored by enemas, liquid nourishment, and subcutaneous injection. Gastroenterostomy is then done, and, after two or three weeks, when the patient is greatly improved, a pylorectomy is made, both operations being accomplished with greatly lowered risk to life.

Physics are less freely used than formerly. Because of their great depletion of the body fluids and the fact that they disturb rest, laxatives should be given two or three days preceding the operation, instead of the night before.

There probably has been no more noticeable change in the preparation of patients for operation than that of preparing the skin. The old methods of applying soap poultices for several days so lowered the resistance of the skin to germ life that the area of operation was often a mass of pustules, a condition seldom seen in emergency operations. The present-day method of iodine application and similar rapidly acting agents has almost eliminated such infections. With these superficial cleansing methods, however, much care is used to protect and cover the skin about the incision during operation.

More attention is now given to relieve the suffering of surgical patients, at least during the first and second days after operation, by opiates and sedatives. These are not carried to the extent of obscuring the pain as a symptom of serious complication. Senn is quoted as having said that "when the last suture is tied in abdominal surgery the fate of the patient is sealed," a saying which is not true to-day, for many patients are saved by reopening the abdomen for late hemorrhage or for obstructive conditions of the alimentary tract. Enterostomy made at the end of the third day from the commencement of obstruction has saved many lives; if done later the results are not so successful. Patients in poor nutritional condition may be tided over temporary periods of gastric paralysis by jejunostomy. Dilatation of the stomach following abdominal operations is more common than was formerly supposed; however, if discovered early, it may not be serious. If patients are not doing well, even if they do not complain of the stomach, a tube should be passed. Should there be dilatation, caused by paresis, the stomach should be emptied every six or eight hours until relief is obtained. If intestinal obstruction occurs it may be relieved by enterostomy as late as the night of the third day or the morning of the fourth.

Primary infection now rarely occurs in clean cases. A dry wound with a light dressing held by adhesive strips is the rule. Delayed infection, formerly attributed to catgut, we now know to be frequently caused by a dead space in which a blood-clot has become infected by bacteria carried

through the vascular system from some local focus. These, however, should be classed among the preventable troubles. Large amounts of antiseptic catgut, used as sutures and ligatures in a limited space, become a menace from the chemical irritation, and the consequent excessive secretion, of the wound, such excessive secretion being nature's method of washing out the antiseptic preparation before the phagocytic activity of the leucocytes has developed.

Induration of the wound should be looked for in patients with slowly rising temperature after five days, and, if found or suspected, should be opened by puncture.

Much benefit comes from the intelligent use of bacterial serums and vaccines in chronic diseases. If not effective, they are not so much to be discredited as is their preparation, selection, or employment.

When patients are compelled to remain in bed for a long time they should be turned and moved as much as possible. They should also be urged to keep their limbs moving as much as their position and condition permit, which aids markedly in inhibiting muscular weakness occasioned by prolonged rest.

Getting patients out of bed as soon as possible after operation conserves strength, improves the mental attitude, prevents the lowering of blood-pressure and the change in the heart-muscles, and, apparently, has reduced the percentage of sudden deaths from embolism. The sooner patients can be removed from the depressing influence of general hospital life the more rapid their convalescence.

INTRASPINOUS TREATMENT OF TETANUS WITH LARGE DOSES OF ANTITOXIN.

WALTHER (*Surgery, Gynecology and Obstetrics,* January, 1916) presented a report of the work of Pignol, Brisset, and Lémonnier in the treatment of tetanus. There has been a tendency recently to give very large doses of antitoxin, no matter how administered. Castaigne has given as much as 760 Cc. in twelve hours. The above authorities have had much better and prompter results by giving the antitoxin intraspinously. They have brought about recovery with less than 200 gm. of serum. After giving the injection they place the patient's body in a slanting position with the head down. Another part of their treatment is efficient care of the wound, free incision, removal of projectiles, and exposing as large a surface of the wound as possible to the air, in addition to the use of suitable antiseptics. The objection has been urged to their results that they took only favorable cases, those with a long incubation period, but they say they took the cases without selection, and that, moreover, a parallel series of cases not given their treatment all died, though some of them had long incubation periods.

Among 36 cases 3 died of complications, septicemia, pulmonary gangrene, and pneumonia. Of the remaining 33, 6 died, or 18 per cent. Three of these cases were extremely acute forms of respiratory tetanus with paralysis of the diaphragm and the respiratory muscles. Leaving these out of account gives three deaths in 30, or 10 per cent. The treatment should be used more extensively and further statistics collected.

THE RADICAL TREATMENT OF PERITONSILLAR ABSCESS.

BARNES (*Boston Medical and Surgical Journal,* December, 1915) holds that quinsy may be considered a submucous abscess of the tonsillar sinus, the pus being confined between the tonsillar capsule and the muscular walls of the fauces immediately subjacent to it—the superior constrictor of the pharynx externally, and the palatoglossus and palatopharyngeus anteriorly and posteriorly respectively. The pus may dissect the capsule away from the muscles over a large portion of the sinus. Anterior and posterior abscesses are usually easily accessible by incision through the anterior pillar or between the posterior pillar and the tonsil. When the pus is confined to the space between the body of the tonsil and the superior constrictor muscle, the task of reaching it by incision is not always an easy one. Ballanger has proposed a capsular

dissection of the tonsil backward until the abscess cavity is reached. Provided ankylosis of the jaw be not fixed (and it usually is in quinsy), this method is readily carried out and is practically sure of success. A further step lies in complete dissection of the tonsil suggested by Coolidge. He has operated on ten cases by this method and regards it as much safer than the simple incision, unless the abscess be so large that the quantity of pus evacuated constitutes in itself a source of danger. The only fresh wounds are those made through the plica anteriorly and posteriorly. After dissection, instead of a closed abscess sac and a poorly drained fresh incision, there remains a simple open ulcer, the walls of which are everywhere rendered practically impervious to absorption, and it will be appreciated that this radical treatment is far less dangerous from the standpoint of streptococcus infection than the older method of simple incision.

Quinsy is said not to become suppurative until the fourth or fifth day of the disease, but dissection of the tonsil will convince any one that there is pus on the second or third day, and it is too deeply situated to be reached by an ordinary cut. It is desirable not to perform the operation before the third day, as before that time the walls of the sinus are not sufficiently infiltrated to offer a suitable defence against streptococcic infection.

The operation of tonsillectomy in these cases differs only slightly from the usual procedure by the dissection method. It is essential that the dissection be a clean one, and that the muscular walls of the sinus be as little injured as possible. If one of the larger veins is opened, the chances of general streptococcus infection are distinctly increased. To avoid this, it is necessary that the field of dissection should be seen at every step. Now these tonsils are always tightly adherent to the sinus walls, except over the area occupied by the abscess itself. It is difficult, therefore, to find the line of demarcation between the two after the first incision in the plica has been made. The usual more or less blind evulsion of the superior lobe by blunt instruments or by probe-pointed knives is dangerous, as the sinus walls are almost sure to be injured. To insure against this, Barnes has found a pillar retractor essential. The one he used is not unlike Killian's retractor for the lacrimal sac, except that the handle is longer, the blade broader and thinner, and the curve somewhat greater. After the first incision in the plica has been made, the retractor is inserted by an assistant under the free edge, and the plica and pillar gently pulled outward and forward. At the same time the tenaculum holding the tonsil is pulled inward, so that the line of demarcation between the capsule and the sinus wall is easily discerned at the apex of the resultant V-shaped cleft between the two tissues. The lightest touch of a sharp knife serves to deepen and widen this cleft, which is in this manner extended backward until the abscess cavity is reached. A gauze sponge on a holder is then inserted against the incision and the abscess cavity allowed gradually to empty itself. If there is a large amount of pus, several sponges may be required to absorb it. This, however, causes no embarrassment, as the stream may be cut off or turned on at will by the valve-like action of the plica and anterior pillar controlled by the retractor. When the pus has been completely evacuated, the dissection is again carried on as before until the tonsil is sufficiently freed to allow of the easy application of the snare.

The bleeding during this operation is surprisingly slight, no greater, indeed, than that which occurs in the usual operation on the non-adherent tonsil.

The question of the disposition of the other tonsil is a delicate one. Barnes has always removed it; and though cogent reasons undoubtedly might be advanced against it, he has yet to see any untoward results that would lead him to change his belief in its safety.

The results of the operation are particularly gratifying, especially to the patient. All the local symptoms subside with surprising rapidity, so that on the day following operation the sore throat of tonsillectomy

alone remains. Strangely enough, this last symptom is always quite mild on the side of the abscess, and patients invariably remark upon the fact. The lessened sensibility of the wound is probably due to the infiltrated condition of the tissues.

FOOT-STRAIN AND OTHER COMMON FOOT DEFECTS.

MARSHALL (*Boston Medical and Surgical Journal,* December, 1915) roughly groups these cases as follows: Simple relaxation and strain; rigid flatfoot and allied conditions; foot-strain accompanying other distinct pathologic states; miscellaneous lesions confused or associated with foot-strain.

There are deformities without symptoms and symptoms without deformities.

Treatments must be something more than merely local mechanical ones. General conditions have to be thought of in every instance because a large proportion of all cases of simple strain give histories of overwork, debility, "autointoxication," or other vague run-down states which should have medical care to insure quickest recovery.

Physicians themselves too frequently treat foot-strains as mechanical weaknesses, to be supported simply with mechanical props, or they tinker surgically with feet to improve only local structural peculiarities. Such mechanical or surgical methods are necessary for success very often, yet the fact remains that failures which still occur after them originate in neglect of internal medical treatment. The latter corrects complex physiologic peculiarities which all patients possess in addition to their anatomic ones.

The underlying vascular peculiarities of rigid flatfoot are little known. There may be some additional substance, or group of substances, or some unusual proportion of an ordinary constituent, in circulation in rigid flatfoot which produces irritations of synovial membranes and increased stiffness in the muscles. There are no methods of telling surely whether muscle spasm in such instances is a simple reflex phenomenon, or is due directly to influences of circulating substances upon muscles, or whether there are combinations of these two theoretical possibilities. We do know, however, that circulating bacteria, lodging and developing within joints, will set up inflammatory changes and that the latter may produce joint adhesions. It is a well-known fact also that there is often increased reflex spasm in muscles controlling inflamed joints. It seems not improbable, therefore, that sometimes a group of bacteria, or their toxins, may be causative agents in rigid foot conditions. Different grades of virulence in bacteria and in bacterial products are recognized, and make it easy to account theoretically for all the many varying degrees of stiffness which are found clinically in feet, as the latter are affected by these variable irritants. At times there appear to be selective actions in these unrecognized substances, or special lowered resistances in certain groups of muscles and ligaments, that result in some parts becoming more affected than others. This is the case in spasm of peroneal muscles, also in osteal changes at insertions of Achilles tendons and plantar fasciæ, where calcifications and spur formations frequently occur. Discussions of selective actions of circulating substances and resistances of particular tissues, however, cannot be entered upon.

We know only that some feet gradually become painful and stiff instead of becoming painful and pathologically relaxed, also that rigid types often run longer courses than mild simple relaxations. Benefits are derived in rigid states from protective strappings and supports as in relaxed ones, but in addition there often are needed in rigid types other manipulations to break adhesions and to restore normal positions. Plaster casts are required, too, for complete rest and to preserve corrected positions. Local spasms of peroneal muscles have been treated by divisions of peroneal tendons to prevent increasing deformity, but underlying causes are not influenced by this method.

Errors commonly observed are those of patients or physicians who conclude, for example, that flexible shoes are harmful

because some persons are made worse after their use while other patients are benefited by use of foot supports; or oppositely, that plates are bad because they do not relieve some individuals who are helped by exercises. Mistakes in these instances consist in comparing things which are unlike each other, and instead of successes of one method logically should be compared with successes of the other, also failures with other failures. In addition, it is unjustifiable to compare supports with exercises because they are physiological opposites. They complement, not duplicate, each other's action in treatment. They are not antagonistic to each other, as some imagine, because different; and both are needed very frequently before normal functions are completely restored.

Another common error is to place so much emphasis on certain features, broad-toed shoes and low heels, for illustration, that other facts are obscured which should enter into consideration. There can be no doubt that broad toes and low heels are ideal styles for persons who have never worn shoes; but in fairness it must be admitted that the majority of women still wear moderately high heels and shoes without extreme toes. They do this with less discomfort perhaps than the smaller group of women who are obliged from foot-strain to wear more correct styles. Considerable maltreatment is compatible with continuance of normal foot functions in the large majority of persons because compensating functional changes occur which offset slightly unfavorable conditions imposed by faulty foot-wear. Eventually such defective conditions slowly become more comfortable and normal than original ones, when bones, muscles, and ligaments have accommodated themselves long enough. Efficiencies of the feet are lowered somewhat by these changes, yet they are good enough still for all practical uses; so that we should hesitate about making too radical changes in long accustomed styles of foot-wear of persons of middle age and past, when their foot symptoms are not very severe nor of long duration.

Misconceptions of the relative importance of anatomic and physiologic foot peculiarities perhaps are the commonest and most important errors encountered. Anatomic peculiarities can be recognized at a glance, or, if hidden, they are convincingly revealed in *x*-rays. Physiologic peculiarities on the other hand cannot be estimated readily, namely, the healthy vitalities of synovial and subcutaneous tissues, cartilage, bone, and fasciæ, as these various tissues resist mechanical frictions, strains, heat, cold, and traumatic influences to which they are subjected. Physiologic peculiarities, strength of muscle, tissue resistance, etc., are all dependent closely upon variable conditions of blood and lymph, but variations from time to time in vascular proportions unfortunately are almost entirely unknown.

In practice naturally, therefore, intangible unknown physiologic peculiarities are easily forgotten or disregarded, and attention instead soon is directed entirely to easily understood structural variations. This error is of fundamental importance, having direct bearing on surgical procedures, internal medical treatments, and orthopedic appliances. It creates strong tendencies toward unnecessary fitting of mechanical braces, toward too much surgery, and toward overestimation of the importance of anatomical features with corresponding underestimations of functional aspects of each problem.

Abnormal symptoms are most reliable criteria by which to judge the lack of balance between physiologic and anatomic peculiarities. Feet should not be treated because they are flat simply, as some of our best athletes have symptomless flatfoot; nor is it necessary to operate upon symptomless hallux valgus deformities or os calcis spurs because of anatomic considerations alone. Great severity or long duration of pathological symptoms occasionally present indications for immediate interference when structural defects are almost negligible, excessive use under average anatomical conditions being the principal causes in some of these instances.

Another error seen in practice is the

furnishing of too much artificial support for weak feet, or giving right amounts of support for an unnecessarily long time, thereby weakening muscles and ligaments from disuse.

Patients are fitted frequently with foot-plates, but have no directions given them about discontinuing supports when symptoms have been relieved. Feelings of weakness noticed when plates are first removed, after having been worn for considerable periods, make such patients inclined to continue the use of plates to the detriment of the strength of their feet. This should be avoided by explanations made at the outset.

Barnes draws the following conclusions:

Avoid the routine use of any single special method.

As a starting-point, observe the kind of shoes worn; pathological signs and symptoms in the feet; the amount of use of the feet demanded; the state of health and its recent changes; the past history and treatments; and then, proceed gradually to make necessary alterations and prescriptions in careful manner.

Remember that treatments have to be ended skilfully as well as begun properly, and accordingly discontinue the use of plates, straps, medicines, etc., at best times.

In simple relaxations and strains, or in rigid foot, support the feet with adhesive straps at the outset and simultaneously prescribe suitable tonic-eliminative drugs. Later, from responses to those two measures, and after taking into consideration all circumstances and social conditions of patients, continue with strappings, make changes in shoes, fit plates, prescribe special foot exercises, or suggest other manipulations, plaster casts, etc., as seems best according to physiological requirements of each successive situation.

Do not exaggerate the importance of easily recognized anatomic defects nor underestimate equal values of obscure physiologic peculiarities. Remember that all patients have vascular systems; that possibilities of blood variations have to be dealt with in all cases, and many times are only ways of attacking physiologic defects; furthermore, that regulations of vascular defects sometimes are simple, although defects themselves are complicated or unknown.

Avoid unnecessary surgery, and too much treatment with orthopedic appliances, by taking into account first always the severity and duration of abnormal symptoms; and by remembering that pronounced anatomic peculiarities often are compatible with continued normal physiologic activities.

Treat special foot diseases in appropriate special ways.

Whenever there are recurrences in underlying causes of foot-strains, or other defects, as quite commonly happen at irregular intervals, there are likely to be recurrences also of pathological foot symptoms. These must be expected in some instances, and decisions made then between repetitions of former successful methods and trials of novelties of uncertain merit. Much can be said in favor of adhering to well-tested efficient methods in preference to experimenting too quickly with doubtful new variations. Patients ought to understand the situation.

Explain to patients the limitations and possibilities of comprehensive methods and of single special ones sufficiently for them to understand the necessity of the former for best results, although they may be complicated and include a number of different stages. Demonstrate the inadequacy of any single method of treatment, old or new, in fulfilling the various requirements likely to be met, and which shift from time to time in the same person. Make it clear that these common and comparatively trivial foot troubles require nearly as comprehensive understanding for their skilful treatment as serious orthopedic conditions in other parts.

CEREBROSPINAL MENINGITIS.

This inflammation, which OSLER (*Practitioner,* January, 1916) characterizes as a form of meningitis, is not only interesting as an epidemic, but as having the fortunate distinction of being the only variety from which recovery takes place in from 50 to 70

per cent of the cases, having been widespread and permanent in England, particularly among the overcrowded, actively worked young soldiers, and subject to a special study. Whilst recovery in the tuberculous, pneumococcic, or streptococcic varieties of meningitis is a rarity, the meningococcus, of which there are numerous strains, has a distinctly lessened death-rate. Concerning prophylaxis of this affection, it must be remembered that the germ is ubiquitous and is harbored by many who show no symptoms of the disease, but producing in others a mild catarrh, the meninges being reached in but a few. The concentration of human beings, particularly young recruits in camp, should be regulated, as should all causes for exhaustion, chill, and the excessive use of tobacco, which favors pharyngeal catarrh.

According to Osler the prophylactic use of antimeningitic serum is still on trial. With our present knowledge, specific therapy combined with lumbar puncture is the rational treatment, combating the sepsis by means of the one, and the pressure effects of the local exudate by the other. The long studies of Flexner and his pupils and others have made possible the production of a serum which has a specific influence on the meningococci in the spinal canal. Sophian's tabulation shows an overwhelmingly strong case for the specific therapy.

Osler reports an outbreak among Canadian soldiers at Salisbury, where 40 cases were treated, with 26 deaths—a mortality of 63 per cent. There was no benefit from the sera, obtained from several different sources. In one case the meningococcus was isolated 2½ months after the illness and after more than 20 intraspinal injections had been given. In another case the meningococci were found in the fluid five weeks after the onset of the illness, during which there were 12 injections. At Haslar there were no better results. The serum was abandoned after eight deaths in twelve cases. The reason for the wide-spread failure is probably incident to inert sera. It is not known in how many cases the parameningococcus was present. Moreover, there has been insufficient dosage, failure to treat cases early, and imperfect technique. There are, moreover, cases which resist all treatment.

Robb (in the same journal) notes that before the injection of the serum of Flexner he had under his care 275 cases, and the death-rate was 72 per cent. He then received from Dr. Flexner a supply of the serum. He began its use in September, 1907, with results which were truly dramatic. The death-rate fell at once to one-third what it had been—in other words from 80 to 26 per cent. The mortality of the cases not sent to the hospital in the same epidemic was 85 per cent. In no series of cases in subsequent epidemics was the mortality in excess of 30 per cent. It is absolutely impossible to give a reliable prognosis. Even the worst cases may recover. The results during 1914 were not so good—36 per cent. The opinion is expressed that much of the serum which was sent to England last winter was of much lower standard value than that supplied formerly. On this basis is accounted the less satisfactory results.

With this in mind Robb took some serum from Flexner's laboratory, with which he has treated eight cases, with only one death. His latest case, a soldier, admitted when twenty-four hours ill, was deeply unconscious, with normal temperature, cyanosis, stertorous breathing, and the dreaded slow pulse. On puncture, thick, syrupy pus was obtained. He was given 40 Cc. of serum; next day he could be roused, but had paralysis of one side of the face, and on the following day paralysis of the arm on the same side. He then steadily improved, and the paralysis completely cleared up. He received five injections totaling 140 Cc. of serum. Robb advises that the injections be made under a general anesthetic, preferably chloroform, unless this be obviously for some definite reason contraindicated. Withdrawal of the fluid often gives rise to severe pain. The injection may give rise to almost unbearable anguish. A full dose of 20 Cc. should always be given, except in young children, when it should be from 3 to 12 Cc.

Rolleston notes that from the commencement of the war to July 31, 1915, there were 170 cases of cerebrospinal meningitis in the Royal Navy. There is a noticeable failure in the therapeutic effect of the intrathecal injection of antimeningococcal serum. The cases treated solely by the intrathecal injection of serum and lumbar puncture showed a higher death-rate than that of the whole 163 cases. The injection should be made at the earliest possible time, this markedly influencing the mortality. When given later than the seventh day a very small percentage gets well. Alarming symptoms directly after the intrathecal injection occurred in two cases only. Serum rashes were noted in 20 per cent of cases. No severe anaphylactic symptoms were observed. Lumbar puncture was performed in 149 of the 163 cases. It is advised that the men who recover be invalided, since they are likely to be intermittent or periodic carriers who alternately give negative and positive results from the examination of throat swabs for meningococci.

Foster records on limited experience failure with the serum and expresses his belief in the helpfulness of lumbar puncture.

Sutherland lays down as predisposing causes to the malady overcrowding, overfatigue, nasopharyngeal catarrh, and inadequate ventilation.

AN IMPROVED SUBSTITUTE FOR IODIZED CATGUT SUTURES.

WATSON (*Surgery, Gynecology and Obstetrics*, January, 1916) has shown as the result of tests that, under the conditions of the test, a one-to-one-thousand solution of potassium mercuric iodide will kill bacillus coli communis in ten minutes, staphylococcus pyogenes aureus in six hours, and even the sporulating bacillus subtilis in twenty-four hours. It will be seen that this strength of potassium mercuric iodide is superior in its germicidal action to a one-to-one-hundred solution of iodine. When it is borne in mind that the catgut used in the test had been soaked in vigorous cultures of the three organisms before immersing in the disinfecting solutions, it is evident that a one-tenth of one-per-cent solution of potassium mercuric iodide would effectually sterilize sutures which had been contaminated in such handling as that received in the operating-room. Since, in such a dilution, it is entirely free from any irritant or toxic action it would seem that this salt is to be greatly preferred to iodine.

Having determined its bactericidal efficiency, tests were made on the influence of potassium mercuric iodide solutions on the tensile strength of various sutures. Samples of catgut sutures of various sizes were carried through the process used in the preparation of iodized catgut, substituting a one-per-thousand alcoholic solution of potassium mercuric iodide for the iodine solution ordinarily employed. Comparative physical tests were then made on the sutures thus prepared, on sutures iodized in the usual way, and on ordinary catgut.

The results of this series of tests are striking. The figures for iodized catgut bear out the statement made above concerning the detrimental action of iodine on suture material. On the other hand, the substitution of potassium mercuric iodide for iodine not only obviates this disadvantage but actually increases the tensile strength of the catgut strands, so that sutures so treated withstand an appreciably greater strain than do the plain grades.

A decided objection to the iodization of catgut is the effect produced on such gut by boiling the tubes for the purpose of sterilizing them preparatory to an operation. The gut shrinks and shrivels and is rendered unfit for use when subjected to the temperature of boiling water. This necessitates a recourse to chemical sterilization, which is less convenient. It was hoped that sutures impregnated with potassium mercuric iodide would not be affected when subjected to boiling in sealed tubes. Tests were made by tubing sutures so impregnated in chloroform and then placing the sealed tubes in boiling water for five minutes. It was found that, while the iodized gut shriveled, the potassium mercuric iodide gut remained unaffected.

Potassium mercuric iodide, in alcoholic solution in a dilution of one to one thousand, has more than ten times the germicidal efficiency of one-to-one-hundred solution of iodine in alcohol.

The impregnation of catgut sutures with potassium mercuric iodide, by increasing the tensile strength of the gut, offers a distinct advantage over the similar use of iodine.

MALIGNANT TUMOR OF THE KIDNEY.

WILLAN (*British Medical Journal,* Nov. 27, 1915) sums up his paper on this subject as follows: Excluding children, 63.2 per cent of the cases occurred between the ages of forty-five and sixty-five.

The commonest onset symptom was painless hematuria.

In 32 cases out of 52, pain, hematuria, and a palpable renal tumor were associated at some stage during the illness.

In three cases a varicocele was a complication—that is, the condition was inoperable when first seen.

Two patients had clot retention of urine.

GLANDULAR TUBERCULOSIS.

TICE (*Chicago Medical Recorder,* December, 1915) quotes Parks's research to the effect that the bovine type of infection predominates in infancy and exhibits a predilection for the cervical glands, next in order the abdominal glands; then generalized tuberculosis, including meningitis.

A clinical diagnosis of a glandular tuberculosis may be relatively easy and definite when the external groups are involved, such as the cervical, axillary, or inguinal. The task, however, is far from easy and the diagnosis only "tentative" if the internal groups are in question, as the tracheobronchial and mediastinal or the mesenteric. If the diagnosis depends on the demonstration of the tubercle bacillus, either microscopically or by inoculation, the difficulty is greatly increased and often amounts to an impossibility, associated with the probable location or focus of infection.

Of the many and various symptoms and physical signs which have been described in the clinical recognition of a tuberculosis of the tracheobronchial and mediastinal glands, none are more than suggestive. The same may be said of the diagnostic use of tuberculin.

The best that can be said for the diagnostic use of tuberculin is that a positive reaction indicates a tuberculosis, but it furnishes no information whatever as to the location of the infection or as to its activity. Consequently, it can be only of limited service. Of far greater assistance is the use of the fluoroscope and skiagraph. In many instances the probable diagnosis of tracheo-bronchial-mediastinal gland involvement is only to be made by such means.

In the treatment of glandular tuberculosis much has been accomplished as a result of the active, systematic efforts against tuberculosis in general. The work done by the various milk commissions in providing a certified milk, free from danger of tuberculous infection, must have had a far-reaching influence. The present wholesale removal or enucleation of the tonsils, while condemned by many, is certainly commendable from the standpoint of the prevention and treatment of glandular tuberculosis. To this, perhaps, is to be ascribed the marked decrease in the necessity of surgical interference for tuberculous cervical adenitis. Formerly it was the custom to remove these glands, and too often further infection promptly occurred, requiring operation after operation, but to-day such operations are relatively infrequent. Aside from the usual hygienic, dietetic treatment, considerable benefit is to be had from the judicious use of tuberculin.

In conclusion it is necessary to direct attention to the relation of glandular tuberculosis to immunity. In infants and children, a tuberculous infection is quite the rule, as already indicated. Depending on the amount and virulency of the infection, there is produced a hypersensitiveness resulting either in an immunity and a protection from tuberculosis, or the opposite condition of anaphylaxis, which leads to further progress of the disease and a fatal termina-

tion. From this view the mild, unavoidable glandular infections are not harmful and dangerous, but are really "beneficent vaccinations."

TREATMENT OF SEPTIC WOUNDS WITH EQUAL PARTS OF ICHTHYOL AND GLYCERIN.

DUGGAN (*Practitioner*, January, 1916) for a beginning selected nine of the worst septic cases from about 800 patients. In two the patients' limbs were saved from amputation, two huge wounds being healed over in five weeks without skin-grafting. All the cases did exceedingly well. The advantages claimed are: There is practically no irritation of the wound; the dressing does not adhere to the surface of the wound, and need only be changed once in twenty-four hours—in very extensive septic wounds, not more than twice in twenty-four hours; there is a great saving in cotton-wool, lint, and bandages; the strain in nursing is lessened; the patient is no longer disturbed by frequent dressing, and the time in hospital is very considerably curtailed, as compared with other methods.

The effect of ichthyol on a wound with thickened, unhealthy edges has to be seen to be appreciated; the edges appear simply to melt away.

Patients all volunteered the statement that the treatment suited their wounds better than anything which had previously been applied either at the front or in England. The ordinary methods used in surgery must be applied; necrosed bone, bullets, pieces of clothing, etc., should be removed, abscess cavities opened to their full extent, and counter-openings made where sinuses are present, when this is practicable. The method of application to the wound is by means of a camel's-hair brush. Or the application may be made upon lint or gauze. The surface of the wound is not washed with lint on changing, but is dried with a small swab of cotton-wool or occasionally dabbed with pure alcohol. All ordinary antiseptics are discarded. Adherent dressings are loosened by pure boiled water. Drainage tubes are always removed after the first dressing, as they are regarded as unnecessary and as the cause of much suffering.

REVIEWS.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., Assisted by L. F. Appleman, M.D. Volume One, March, 1916.

The March issue of *Progressive Medicine* contains, as in previous years, an article upon Surgery of the Head and Neck, by Charles H. Frazier, M.D., of the University of Pennsylvania; one upon Surgery of the Thorax, Excluding Diseases of the Breast, by Dr. George P. Müller, of the Philadelphia Polyclinic; another upon Infectious Diseases, Including Rheumatism, Pneumonia, and Influenza, by Dr. John Ruhräh, of the College of Physicians and Surgeons of Baltimore; another upon Diseases of Children, by Floyd M. Crandall, M.D., Consulting Physician to the Infants' and Children's Hospital of New York; another still upon Rhinology and Laryngology, by Dr. George B. Wood, Laryngologist to the Orthopedic Hospital, Philadelphia; and, lastly, a chapter upon Otological Literature for the past twelve months, by Dr. Truman L. Saunders, Chief of Clinic, Vanderbilt Clinic, and Instructor in Otology in the College of Physicians and Surgeons, New York.

These articles are designed by their authors to represent the gist of contributions to their various subjects during the past twelve months, and each has endeavored to write an interesting story of the progress made.

A HANDBOOK OF MASSAGE. For Beginners. By L. L. Despard. The Oxford University Press, New York, 1916. Price $2.00.

Some years ago we reviewed in terms of praise a much larger and copiously illustrated volume entitled "A Text-book of

Massage" by the same author. The present volume seems to have had its origin in the fact that, with the development of the great war, many people are learning to massage in order to help wounded soldiers, and these need a small, condensed volume for this purpose. We do not see that in the process of condensation the author has been able to save much space. If we were recommending a book to be read by a "rubber," we still would advise the larger volume, if cost was not a factor. When cost is a factor the present volume can be cordially commended.

There are fifteen chapters, the first of which deals with the Influence of Massage, the second with the Description of Massage Movements, and the third chapter with Active and Passive Movements. Massage of individual portions of the body is then taken up, and, after this, massage for various injuries to ligaments and bones is considered. The succeeding chapters deal with remedial measures in deformities, paralysis, and diseases of the circulatory system, and constitutional disease. There is also a chapter upon Lubricants, Fomentations, and Bandages. The last chapter, which covers about thirty-eight pages, deals with Medical Electricity.

As there are nearly one hundred illustrations, and as the text is clear and lucid, it will doubtless prove popular, not only in England but in this country as well.

DIET FOR CHILDREN. By Louise E. Hogan. The Bobbs-Merrill Company, Indianapolis, 1916.

The authoress of this book has already published a number of essays upon kindred topics. Her design in this instance is to provide mothers and nurses with an inexpensive text-book which will show them the working out of the principles which are essential in child feeding. There are a number of chapters which are interesting and to the point, as recipes for broths and soups, as well as desserts.

The opening chapter deals with the question as to what mothers, teachers, physicians, and nurses must understand for the proper feeding of children, with the description of various classes of nursery foods and the foods which children should not receive.

The book does not seem to be in any sense an original contribution, but a compilation of views obtained from standard medical and other works.

DIAGNOSTIC METHODS. A Guide for History Taking, etc. By Herbert Thomas Brooks, A.B., M.D. Third Edition, Revised. C. V. Mosby Company, St. Louis, 1916. Price $1.00.

This is a small volume of less than one hundred pages, differing from the second edition in that a new chapter on the Technique of Staining and Examination of Smears, and the most Important Exudates, has been added. Originally intended for medical students, hospital internes, and physicians who have a limited amount of time to give to laboratory work, it has well met the object of its author. Definite, direct instructions are given as to the procedure which shall be followed. After instructions are given as to how the history should be taken, the various laboratory tests and office tests are described briefly, but so much to the point that one can lay the book upon the desk and follow it, line by line, in making his tests. We expect to refer to it frequently.

CANDY MEDICATION. By Bernard Fantus, M.D C. V. Mosby Company, St. Louis, 1915. Price $1.00.

The author tells in his preface that candy medication has given such delightful results in practice among children that he believes it should be more widely known and resorted to. For a long time it has been recognized that Dr. Fantus had made this subject his "hobby," and he has now prepared a little book in which sweet tablets containing drugs, more or less active, are described with the methods by which they may be made. Altogether he gives us fifty-eight of such formulæ, and then other formulæ which are designed for the making of stock preparations.

A HANDBOOK OF INFANT FEEDING. By Lawrence T. Royster, M.D. Illustrated. C. V. Mosby Company, St. Louis, 1916. Price $1.25.

The idea of this little book was suggested to the author as a result of consultation in feeding cases with many general practitioners. He states that there is little in it that cannot be found in most standard works, but that his object has been to put

the necessary information for the busy practitioner in small space so that it can be readily obtained.

There are fifteen chapters, with an appendix, which deal with the feeding of the healthy infant and the infant who is ill. There are also sufficient number of pages devoted to description of variations from the normal in the processes of digestion in infancy to indicate when modifications of the diet should be made. In other words, Dr. Royster has prepared an interesting and useful little manual which busy men will be glad to have.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

This month I am afraid there is not very much news of a medical character to detail. The calling up of the men of military age is continued. There is a popular idea that too many are being put back or entirely exempted by the Tribunals. Each of the Tribunals has one working man on the committee, and I am told that the working man is far stricter against granting exemptions than the other members of the Tribunal. The arrangements for the supplying of medical men for the future are being carried out, and at present there is apparently no dearth of medical men, and none have had to be called out at present under the scheme detailed last month. In connection with this scheme it has not been clearly stated whether medical men under the age of forty are liable to compulsory service, or exempted on account of their profession, and therefore only liable to be called up on the recommendation of the War Emergency Committee after signing a form offering to accept a commission. There ought, however, to be no mistake on this point of the medical men of military age being liable to compulsion, and the Central Medical War Committee is only allowed to say that any individual is indispensable either to his hospital or to the locality in which he practices. Steps are being taken to make this point clear to those whom it may concern.

The medical cases admitted from the front to the hospitals are very similar to those mentioned before. A few paratyphoids of a mild type, which have escaped the net in Flanders, some pulmonary conditions—*i.e.*, bronchitis and asthma—a few frost-bites, and a number of cases of rheumatism. Here and there a case of gout is found, which has been sent over in the rheumatism category. All these conditions are comparatively mild. The paratyphoids are rather a nuisance to themselves because the condition is so very mild, and yet they have to be isolated until proved to be clear of the disease. The routine method is to examine three specimens of feces and the urine. The patients are not given a clean bill of health until three specimens have been proved negative.

There seems to have been some confusion as regards what was to happen to the medical students who were in their final years—*i.e.*, the third to the sixth year. It had been formerly notified from the War Office that they were not to join the combatant forces. They therefore continued with their studies, most of them wearing distinguishing badges showing to which hospital they were attached. Last week they were notified that attestation was necessary. They seemed to have assumed from this statement that they were going to be called up as combatants. Apparently, however, this is a misconception, and attestation was required to complete the Derby scheme. It is probable, however, that they will be asked to join the medical branch of the Officers' Training Corps in order to gain some knowledge of medical service before qualification. It is also possible that they may be asked to serve in the Army Medical Service in a position similar to that of the surgeon probationer employed by the navy. Men who have been through their dressing and clerking can apply for the post of surgeon probationer in the navy, and if ap-

pointed are usually attached to a small boat, such as a torpedo boat or a destroyer. The General Medical War Committee and the various examining bodies have agreed to accept time served in these appointments as counting for time which would have been spent in the hospitals during their curriculum. At the present time the Naval Medical Service is filled, and no more commissions are being given. Applicants may, however, put down their names on a waiting list.

It is believed that a change in the policy of the Medical Department of the War Office is gradually being introduced, in connection with the hospitals. The authorities are gradually closing down the smaller hospitals which have hitherto supplied beds, and have been staffed by civilian practitioners, although of course under the control of the War Office. More direct control is deemed advisable. In order to obtain such control, it is necessary to concentrate military beds as much as possible, and all the staff have to be under the direct control of the War Office, and accordingly they have to be members of the R. A. M. C. This is, no doubt, an advantage to the military, but will most probably increase the expenditure of the Army Medical Service. At the present time when everybody is being made to economize, it seems to some of the public that this is a step in the wrong direction, and that economy is going to be sacrificed for a state of efficiency which is not necessary. At the same time the War Office is cutting down the numbers of the staffs working at the base hospitals, and has introduced a scheme by which fewer will be on regular duty. Some of the remainder will be called up directly occasion requires. This may free a certain number of the redundant staff for other duties. So long as permanent residents look after the wards of the hospitals, this scheme would work satisfactorily. These resident staffs have in the past been regarded as the nucleus from which a large draft could be drawn in case of emergency. If such a draft were necessary, it would mean the calling up of a large number of the senior staff, who would not be nearly so well acquainted with the inmates, to replace those sent abroad.

Although so many men have been called up, there still seem plenty to be seen in the streets and railways. More women are being employed as ticket collectors and lift operators, and each week shows more acting as tram and bus conductors. It is understood that they are not to be employed as drivers of these vehicles, and that the occupation of bus driver or tram driver is one that has been starred. It is very noticeable that the youths now employed in greater numbers are younger than was formerly the case in similar occupations.

This past week there have been snowstorms much heavier than usual at this time of year. The fall has been fairly universal, and in this respect London has not had the fortune to be one of the areas where the fall was light. The usual men employed by the borough authorities to clear the snow were this year dispensed with, and very little effort was made to clear the streets. Due warning was given by the authorities that they did not intend to send out the street sweepers in the event of snow. An exception was made in some of the principal thoroughfares on the third or fourth day, and by means of the usual hose the slush was slowly got rid of. In the residential quarters, however, no efforts were made on the part of the authorities. However, most householders cleaned their own patches—those parts of the pavement lying in front of their own houses. The man who has a corner house is obviously at a disadvantage in this case. Most of the efforts were amateurish, and nobody appeared to have any ashes or sand to dispense. Fortunately it has not frozen, and when the snow was cleared away, the thaw in the day completed the task. If we had been so unfortunate as to have a hard frost on the first or second day, the state of the pavements would have been extraordinarily dangerous. It was, however, quite amusing to see a number of the Fellows of the College of Physicians and Surgeons busily employed with coal shovel and drawing-room carpet sweeper trying to improve the appearance of their front doors.

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ORIGINAL COMMUNICATIONS.

THE USE OF PITUITRIN IN LABOR.[1]

BY COLLIN FOULKROD, M.D.,

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You will observe from the title that we are limited to the action of the drug during labor. Time does not allow for more.

I am still conservative.

It has been of especial interest to read the reports published during the past year by men who have used the drug extensively, and while their results differ from each other, and from my experience, a careful scientific conclusion cannot be reached without considering everything which is accurate in these reports.

The extent to which it has been used can best be judged by a reference to the following papers:

J. L. Bubis, M.D., in *Surgery, Gynecology and Obstetrics* for November, 1915, reaches the following conclusions: "Pituitrin is an ideal oxytocic, in that it is safe when properly used. It may be given in any stage of normal labor. Small doses influence the pains and can do very little harm, but with large doses the uterine contractions are beyond control. The infant mortality and the morbidity of the mothers are much greater when large doses are given."

In this paper he reports three cases of disaster early in the use of the drug: two children were lost and one mother torn badly.

An enthusiastic paper read by Samuel W. Bandler before the last meeting of the American Association of Obstetricians and Gynecologists, and published in the January issue of the *American Journal of Obstetrics and Diseases of Children,* gives these points:

"'When the head is well molded and fixed in and through the brim of the pelvis.' This phrase evidences my conviction as to one of the essential preliminaries which ought to obtain in primigravidæ before pituitary extract may be used by the general medical man. Whatever the stage this rule does not hold good in women who have had one or more children."

The paper closes with these words: "Practically all men are against its use in the first stage. I assert that in this stage, under proper conditions, it is of the greatest aid in furthering the progress of labor."

Four men discussed this paper; two were opposed to the drug, one having seen a rupture of the uterus from its use, and two agreed with Dr. Bandler.

Ingraham and Chase in *Colorado Medicine,* vol. xii, 1915, page 190, report their observations on the use of pituitary extract in 44 obstetrical cases.

Pituitary extract is variable in strength.

The individual patient reacts differently to the drug, and therefore caution should be your rule until thorough acquaintance with the possible dangers in each patient assures you of a safe procedure.

Pituitary extract should not be given by the nurse in the absence of the physician; it should not be given and the physician leave the patient.

The only two points upon which all observers agree are, first, that the ampoules on the market are entirely too large to be put into the hands of the general practitioner for house use, and as a standard dosage a full ampoule should never be used as one dose.

[1] Read before the Philadelphia County Medical Society, Feb. 9, 1916.

At the present we are using one-third of an ampoule, usually five minims.

Most men agree that by itself pituitrin is ineffectual in producing labor when no pains are present.

A consideration of the use of pituitrin must include the causes for which the drug is advanced:

1. Uterine inertia.
2. To control hemorrhage.
3. To differentiate true from false labor pains.
4. To induce labor.
5. To shorten the time of suffering of the woman in normal labor.
6. To enable the doctor to get to the opera, or to the medical meeting.

(6) Let us take up the last first. Is it justifiable to shorten labor, or to induce labor, that the practice of obstetrics may in any manner be regulated? For example, the medical man may have another patient needing him badly. The answer to such a question rests with each individual case, and in some instances it may be necessary to give some of the facts to the husband before doing so. If a safe drug is found I am sure that both patient and physician would be glad to use it.

(5) Is it justifiable to use pituitrin to shorten the time of suffering of a patient who is proceeding normally? From the standpoint of suffering, I am in hopes that the next paper on nitrous-oxide anesthesia will answer the query.

(4) It is the experience of most men that pituitrin by itself fails to induce labor, although Bandler advances the theory that the secretion of the pituitary gland, liberated at a certain time or working in harmony with some other glandular secretion, is the cause of labor.

One patient of my own will serve as a typical illustration:

A multipara, delivered in her first labor by the family physician of a living child, in which labor he expressed the idea that he did everything himself.

Sent to me for second labor. I found it necessary to use bag and manual dilatation to dilate a rigid cervix, and with absolute uterine inertia was compelled to do a hard forceps. This child lived about two weeks and died in convulsions.

The third pregnancy the woman went to a maternity hospital at term, not in labor; was given on two occasions each day for two days one-half ampoule of pituitrin, and no other drug or mechanical attempt to induce labor.

Her pains, not severe, lasted after each dose a varying time from two to three hours, then completely subsided. She was allowed to rest for one day to see if labor would supervene.

On the next day f℥ij of castor oil was given, and she expelled the child almost before I could reach the hospital.

If used after labor has been started with bougies or gauze then it seems to produce an effect. Such use, however, falls under the guidance of the general rules we shall deduce later.

(3) To differentiate true from false labor pains, so strongly do some men believe that pituitrin is inert when true labor is not present that they use a small dose of the drug to increase the pain, which it accomplishes in true labor, but not in false.

(2) To control hemorrhage after labor.

It has been my practice to give an oxytocic drug as soon as the placenta is out of the cervix or mayhap in the lower segment.

Because of the inability of some patients to absorb ergot from the stomach, in hospital practice I have given it hypodermically. Recently I have been impressed with the fact that even under the skin I could not say definitely there was any marked action; therefore, at least one-half of my cases have received either one-half an ampoule, or, in some instances, as much as an ampoule of pituitrin. The results have been variable. The one thing which stands out most prominently in this series of cases is that the only patient in whom I have seen in ten years a true postpartum hemorrhage was one in which pituitrin was used instead of ergot.

My conclusions are that for such a purpose pituitrin gives a more rapid series of contractions, which may soon exhaust the uterus, and that you may or may not have severe hemorrhage afterward unless the

pituitrin is reënforced by the slower long-acting drug, ergot.

Edgar in his paper on the drug in 1913, before the American Gynecological Society, reports giving it in Cæsarian section, as contrasted with ergot, and he says: "Then again the pituitary extract patient passed a large clot from the uterus twelve hours after operation, indicating at least that the action of the pituitary extract was not permanent."

(1) Uterine inertia. Just what is uterine inertia? In a hospital clinic where Cæsarian section was applied as the cure for those cases in which the force of the uterine contractions was not sufficient to engage the head, I was allowed the privilege of examining the uteri of such cases as needed hysterectomy. I was astonished at the unsuspected cases of fibroid uteri and of another condition which we came to call fibrosis of the uterus, in which concealed and incipient fibroids were the cause of the inability to secure good muscular force.

If this in an unknown percentage of cases is the cause of uterine inertia, are we justified in using pituitrin as an oxytocic? I am sure my judgment is against such a measure whether the head is in the pelvis or not.

Uterine inertia due to toxemia of the mother or death of fetus *in utero*. Here again we are unable to control the severity of the contraction after it has left our hands, and I have seen such a uterus rupture upon the slightest provocation.

In uterine inertia due to a tired muscle after a sturdy long first stage, when the contractions have been good, if a complete rest is secured before giving and the head out of the cervix in the pelvis, if ether and forceps are decried by the family, pituitrin may be used cautiously.

Where the uterus gives evidence of beginning to tire out and the exhaustion depicted above has not been reached, and the same situation exists as to the presenting part and the cervix, then small doses of pituitrin may be tried.

My position and conclusions are then practically the same as deduced by Edgar in 1913 and presented in his paper to the American Gynecological Society that year.

Pituitrin must not be used unless the presenting part is definitely engaged in the pelvis and the largest diameter has passed through the plane of the inlet, and then only if the outlet has been carefully measured for any contraction of the transverse diameter. This relates to multiparæ as well as primiparæ. It has been our experience that after several normal labors a woman may develop a child too large to pass through a normal pelvis.

I consider pituitrin in the same class as ergot, and as at present going through the same class of experiments as ergot did before it came to have a settled definite use.

In common with other men I have seen one-half an ampoule give such a tetanic contraction of the uterus that I feared rupture, or if not that, then death of the fetus from contraction of the placental site.

I have seen severe shock from one ampoule of pituitrin: in one instance of a multipara, with the head in the pelvis out of the cervix, the shock was so pronounced that labor was set aside entirely until I relieved her with forceps at the end of two hours, fearing for the child.

The dangers to the child must not be minimized; they seem to come from the secondary action through tetanic contractions more vigorous or more prolonged than nature intended, cutting off the normal circulation of the fetus through some interference at the placental site.

It is yet to be proven that pituitrin is any safer than ergot used in the same proportionate scale of dosage.

4005 CHESTNUT STREET.

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THE PREVALENCE OF SYPHILIS.

BY EDWARD B. VEDDER, M.D.,
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It should be unnecessary to emphasize the importance of determining the prevalence of syphilis. At the present day syphilis is very generally accepted as the real cause of certain conditions such as paresis, locomotor ataxia, and aneurism of the aorta, and as the probable cause of a great variety of cardiac, circulatory, and other conditions whose etiology has hitherto been somewhat vague. The determination of the prevalence of syphilis therefore becomes a matter of vital interest to every practical physician and surgeon, since the knowledge so obtained will aid in the elucidation of the problems which he meets in his daily practice. Furthermore, if syphilis is ever to be brought under sanitary control like other infectious diseases, the first requisite is that we should know the exact incidence of the disease.

The writer has been able to make an investigation into the prevalence of syphilis among the men of the United States army, from which it is believed certain deductions as to the prevalence of syphilis among certain parts of the civil population may be drawn. The results of this investigation have been published as Bulletin No. 8, War Department, Office of the Surgeon-General, entitled "The Prevalence of Syphilis in the Army." An endeavor will be made here to present the results of this investigation in condensed form, but laying particular stress upon the method and reasoning employed in estimating the prevalence of syphilis in certain groups of the civil population.

The Method Employed.—The following groups were studied: (1) Those men just entering the service. (2) Those men who had been in the service some time. (3) Those men who had recently left the service.

The study of the group of men just entering the service is most important from the view-point of this paper, and is the only group considered here because it is from this group that the conclusions as to the prevalence of syphilis in civil life are drawn. This group consisted of 1019 newly accepted recruits who become the enlisted men in the army, and 621 cadets at West Point who become commissioned officers. In the case of these recruits and cadets, no clinical evidence as to the existence of syphilis was obtainable, and the prevalence of syphilis is estimated on the basis of the Wassermann survey alone. Approximately half of the recruits came from the Middle West and were sent to Columbus Barracks, Columbus, Ohio, and half from the East and were sent to Fort Slocum, New York. Blood specimens were taken from all newly accepted recruits at these points without selection, and a Wassermann was performed. With regard to the cadets, a Wassermann reaction was performed on every cadet at West Point.

The Interpretation of the Wassermann Reaction in this Work.—The two plus system of readings was used. All double plus cases were counted as undoubted syphilitics, all plus reactions were counted as probable syphilitics, and the total of the known syphilitics and double plus and plus cases was used as the estimate of probable syphilitics. All of these figures were reduced to a percentage basis with the total number of men examined.

This method is considered justifiable and even conservative. For it is well known that when the Wassermann reaction is applied to all classes of syphilitics, a large percentage will give a negative or plus minus reaction. This is due to the fact that the Wassermann is frequently negative in primary, tertiary, and so-called latent cases. The results obtained by this method are therefore an underestimate rather than an overestimate of the actual prevalence of the disease, if the results of the Wassermann are accepted. All those who believe in the reliability of the Wassermann reaction when properly performed and interpreted will believe that the positive results so obtained afford an indica-

tion of the prevalence of syphilis in the men examined. Those who do not so believe will not accept my statistics. I cannot discuss the value of the Wassermann reaction in a paper of this length, and can only state that the longer the Wassermann reaction is used, and the more accurately its findings are checked with the clinical condition, the stronger becomes our faith in the findings of the positive Wassermann as an indication of syphilitic infection.

The results obtained by this investigation may be tabulated as follows:

Survey.	Total examined.	Known syphilitics, per cent.	++ Wassermann, per cent.	Undoubted syphilitics, per cent.	+ Wassermann, per cent.	Estimate of total number probably syphilitic.
Recruits	1019	0	7.75	7.75	9.02	16.77
Cadets	621	0	2.57	2.57	2.89	5.46
White enlisted men	1577	3.44	4.77	8.21	7.87	16.08
Colored enlisted men	1472	1.08	21.80	22.21	13.11	36.00
Porto Rico regiment	581	13.55	28.81	42.37	13.55	55.93
Military convicts	1145	6.48	9.50	15.98	5.67	21.65
Insane soldiers	567	3.51	8.29	11.80	7 41	19.21
Tuberculous soldiers	229	7 56	15 72	23.28	15.72	39.00
Soldiers' Home*	1171	11.62	13.40	25.02	9.73	34.75

*These figures do not include the results of the luetin examination.

From these figures the following conclusions were drawn as to the prevalence of syphilis in the civil population:

1. We may estimate that about 20 per cent of the young adult male population, of the class from which the army is recruited, are infected with syphilis.

2. We may estimate that about 5 per cent of the young men in our colleges are syphilitic.

3. This study confirms observations that have already been published indicating that syphilis is so prevalent among negroes that it is possibly the greatest single factor in the production of disability and high mortality rates among the race.

4. The high percentage of syphilis among Porto Rican soldiers indicates that syphilis may be one of the important causes of disability among native Porto Ricans.

5. Since syphilitic infection is so common, is productive of so much disability, and has so far entirely evaded sanitary control, it is believed that syphilis is a greater menace to the public health than any other single infectious disease, not even excepting tuberculosis.

DISCUSSION OF CONCLUSIONS.

Inasmuch as the estimate of the prevalence of syphilis among the accepted recruits was only 16.77 per cent, it may be asked on what is based the estimate of 20 per cent for the young adult male population of the class from which the army is recruited. It must be remembered that these accepted recruits are picked men, having passed two physical examinations, which were so severe that approximately 83 per cent of all applicants were rejected. There is statistical evidence to the effect that of these men rejected, approximately 2.3 per cent were rejected for manifest syphilis. The accepted recruits among whom the prevalence of syphilis is estimated to be 16.77 per cent are therefore the cream of the applicants. None of these men were syphilitic so far as could be determined by a physical examination, while among those rejected between 2 and 3 per cent showed manifest lesions of syphilis, and as a group was generally inferior physically. It therefore appears conservative to estimate that 20 per cent of the young civilian males who apply for enlistment in the army are infected with syphilis.

According to the Wassermann survey on the cadets at West Point, we may estimate that from 2 to 5 per cent are syphilitic, although there were no cases at all presenting clinical evidences of syphilis. I am well aware that many will say that under these circumstances so much weight should not be attached to a positive Wassermann, and that this estimate is therefore an exaggeration of the real facts. I have shown that as the Wassermann reaction is performed in this laboratory, the percentage of false positives that may be expected in work of this character is approximately 0.5. But let us assume that the error is much greater, and that as much as one or two per cent of these reactions are false. The incidence of

syphilis at West Point would then be reduced from 1 to 3 per cent. But here again it must be remembered that the cadets are picked men; that they have passed a physical examination, which, in view of the fact that these young men are to become officers, is much more searching than that to which recruits are subjected. Further, it must be remembered that these men, from the time they enter West Point, are under the strictest military discipline and that they seldom leave the reservation. The young men from any of our civil colleges cannot compare physically with cadets at West Point for the obvious reason that no selection based on a physical examination is practiced, and they are subject to no such discipline. All who have known such students know that there is a certain percentage of them who indulge either occasionally or regularly in illicit intercourse. Under these circumstances it is certainly fair to assume that the percentage of syphilis among these college students is higher than is the case for the cadets. If the cadets at the lowest estimate have only 1 to 2 per cent of syphilitics, it is certainly fair to assume a prevalence of 5 per cent among college students. As I am sure the figures for the cadets are higher than 1 to 2 per cent, I feel that the estimate of 5 per cent for college students is very conservative.

I shall not dwell long upon the estimate of the prevalence of syphilis among negroes. All those physicians who have long experience with negroes will agree with me that my estimate is well within the facts, and many will feel that it is hardly adequate. With regard to the latter point, I would simply state again that so far as the negro enlisted personnel is concerned, we are here again dealing with picked men, and that I am sure from other figures which I possess, and hope to publish later, the incidence of syphilis among negroes in civil life is even higher. The wide dissemination of syphilis among the negro race is not appreciated by those who derive their statistics from a comparison of hospital statistics for the white and colored races. This is simply because the colored man, on account of both ignorance and poverty, is not nearly so likely to consult a physician or go to a hospital as is the white man. The army admission rate for syphilitics is given by Boas (*Social Hygiene*, 1915, I, 610) as 3.2 per cent for negroes and 2.2 for whites. For the reason above quoted these figures give absolutely no idea as to the relative prevalence of the disease in the two races, and all comparisons or judgments based upon such figures will lead to erroneous conclusions as to the prevalence of syphilis in negroes. I personally feel quite certain that my estimate of 36 per cent for colored enlisted men is conservative, and that it is fully 50 per cent among the same class of negroes in civil life, and furthermore, that the incidence of syphilis among *negro women* is as high or higher than among the men. This is not true of the white race, where among women of the same class the rates are much lower than for the men. I hope later to publish statistics that will fully corroborate these statements.

In connection with these estimates, several words of caution are advisable. The estimates only apply to certain classes, for the most part supposedly healthy young males. They are therefore estimates of certain definite classes of the population, and any attempt to apply these figures to the population as a whole will lead to error. Nothing is at present known about the prevalence of syphilis in the population as a whole, but I do believe it can be estimated in certain groups. It must therefore be remembered that these figures are not to be applied to women and children, for whom they would be far too high. Equally they should not be applied to the sick in hospitals. It is obvious that the percentage of syphilis will be higher among those sick than among those presumably well. Young white males of the laboring class and artisan class in the hospital should therefore be expected to have a higher percentage of syphilis than 20. Furthermore, the evidence is convincing that the incidence of syphilis increases in any group of the population with age. This is undoubtedly because only a few

patients are really cured, and the older the individual, the more frequent have been the opportunities for acquiring the infection.

It is also important to remember that the incidence of syphilis varies with the class or station in life of the group examined. The disease is certainly not so prevalent among educated and refined men as it is among artisans and laborers. I do not know whether wealth, education, and culture give a man more moral stamina or not. One would think the latter two certainly ought to. But even supposing that the morals of this class of men are no better than those of laborers, the fact yet remains that the former class are much more apt to escape venereal disease because when they do indulge in vice they are able to select their companions with more care; they are much more apt to use some method to prevent infection, and are certain to lay more stress upon cleanliness; and if they do become infected, they are much more apt to secure adequate treatment from a physician of skill, since they have both the intelligence to perceive the necessity for such treatment and the means to pay for it.

The facts are in accordance with this theoretical reasoning. The young men at West Point do not differ materially in age from the recruits. But they come from a much better class of the population, and at most only have 5 per cent of syphilitics as compared with 20 per cent in the class of young men who apply for enlistment.

Again, it must not be supposed that it is claimed that all of this very large number of cases of syphilis are infectious and are therefore a sanitary menace to the community. Nothing could be farther from the truth. While we now know on the basis of scientific experiment and clinical observation that syphilis *may* be transmitted during almost any stage of the disease, yet practically the vast majority of infections are acquired from individuals in the primary or early secondary stages. Such cases, which truly are a menace to the community, constitute not more than three per cent of the male population at any one time, if we may estimate the prevalence of primary and secondary syphilis in the civilian community on the basis of admissions for these conditions in the army.

Our last conclusion, to the effect that syphilis is a greater menace to the public health than any other single disease, therefore needs a little interpretation. It is not a menace in the sense that cholera or typhoid is a menace; that is a disease that may become epidemic and attacks the innocent and guilty alike by most devious and frequently inexplicable methods. It becomes a menace because although we can prevent cholera and typhoid, no practical method that the moralist and the sanitarian can both indorse has yet been adopted for the prevention of syphilis. As a result, the 3 per cent of males, not to mention the prostitutes who suffer from syphilis in the infectious stage, are absolutely uncontrolled, and may transmit their infection without let or hindrance. This fact and the great difficulty of curing the disease explain the wide prevalence of syphilis. However, a disease would not become a sanitary menace even though it were very prevalent, if only it were innocuous. But syphilis not only is not innocuous, ***but is a very fatal disease.*** This fact is seldom sufficiently emphasized, and is quite contrary to general opinion. This is because death certificates seldom give syphilis as the cause of death for obvious reasons. In the past six months I have seen two deaths among the comparatively small number of cases referred to me by physicians for a Wassermann test. One died of cerebral syphilis as the result of an infection acquired only ten months previously, and one died of hemorrhage of the stomach. The latter was a Wassermann fast case who was under treatment for syphilitic ulceration of the stomach. Such fatalities are common, but are called by euphonious names, such as apoplexy, arteriosclerosis, aneurism, heart disease, etc., etc.

In this connection it is interesting to note that in a recent article entitled "Increasing Mortality in the United States" *(N. Y.*

Med. Journal, 1916, ciii, 97), Fisk points out that while the death-rate from the infectious diseases has steadily declined during the past three decades, the death-rates for apoplexy, kidney diseases, and heart and circulatory disturbances have steadily increased. This increase has been so marked that in 1912 the death-rate for organic heart disease exceeded the rate for all forms of tuberculosis. Now when it is known that a considerable proportion of apoplexy is really syphilis, that nearly all aortic lesions of the heart and a considerable proportion of cases of so-called myocarditis are really simply expressions of syphilis, is not the influence of syphilis apparent in this death-rate? And if to this we add the cases of tabes, paresis, and the still-births that are syphilitic, can it be doubted that in spite of general opinion, syphilis is a very fatal disease? This constitutes its menace from the public health standpoint. Syphilis is uncontrolled, it is very prevalent, and it is very fatal. The statement that syphilis is a greater menace to the public health than any other single infectious disease has appeared to some to be an exaggeration. I think the statement is not only strictly correct, but is demonstrable by sound statistical evidence.

THE TREATMENT OF NEVUS FLAMMEUS (PORT-WINE MARK) AND ALLIED CONDITIONS BY FILTERED ULTRA-VIOLET RAYS, EMPLOYING THE COMPRESSION METHOD OF APPLICATION—REPORT OF TEN CASES WITH TWO ILLUSTRATIONS.

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The ultra-violet rays, under certain conditions, have been found to be a successful agent for the treatment of "port-wine" nevi, as well as telangiectases and rosacea, all having the same pathologic anatomic basis, varying only in degree. In the superficial variety of red or bluish-red color, which are based upon subepidermal dilatation with insignificant arterial participation, the obliteration may be complete. In case of hypertrophy of connective tissue, the ultra-violet rays act sluggishly, even after continued radiation, and may not lead to absolute obliteration, but to marked improvement.

THE PHYSICAL PROPERTIES AND PHYSIOLOGICAL ACTION OF THE ULTRA-VIOLET RAYS.

It is known by those familiar with the action of artificially generated ultra-violet rays that when the skin is exposed to them from a distance, even though this distance is short, they have little power of penetration, which property is analogous to the ultra-violet of the sun's rays when sunburn is produced. Likewise they will tan the skin, blonds being more susceptible than brunettes. Bordier and Nogier[5] in 1908 demonstrated that this superficial action is due to the absorption of the rays by the blood, and that ultra-violet rays will not penetrate any substance containing red coloring matter. They act sluggishly when skin pigment is present, as in the brunette. If, however, the tissues are firmly compressed, thereby producing a temporary ischemia, these rays will penetrate to a depth of from one to four millimeters, and under some conditions even more, which is of sufficient depth to act upon the capillaries constituting a "port-wine" nevus, etc. Experimentally, an intense inflammatory reaction has been produced by Hesse[3] and Wichmann[4] in human skin through a rabbit's shaven and scrubbed ear when compression was practiced, but there was no reaction whatever in another area of the same skin when compression was relaxed, though rays from the same source and strength were employed.

These rays will not penetrate the thinnest film of glass or fine mesh fabric, such as photographer's cloth, or tin-foil, but they will pass through air, water, and quartz.

The interposition of a thin piece of dark cloth or adhesive plaster will absolutely prevent the passage of the rays and protect the skin or eyes. When a thin disk of quartz colored blue is interposed, the red, yellow, and green which constitute the irritating wave lengths are filtered out, in consequence of which there is less inflammatory reaction, tanning and swelling of the skin than when this quartz filter is not employed. It has also been found that there is greater penetration when the filter is used. These properties are analogous to those of filtered Roentgen rays when aluminum or sole leather filters are used. In the case of "port-wine" nevi and allied lesions, when compression plus the blue quartz filter is used, thrombosis and an inflammatory reaction is produced in the capillaries comprising the nevus, of sufficient intensity to cause absorption, subsequent loss of function, and final obliteration. One to four applications are necessary, depending upon the character and depth of the particular nevus, pigment of the skin, strength of the ultra-violet rays, time of exposure, and the thickness of the blue quartz filter. The thicker the filter, the longer must be the exposure. A filter of 3 mm. thickness has been found to give best results. It has been noted that brunettes usually require a longer treatment than blonds, which is due to the resistance offered to the rays by the skin pigment. A "port-wine" nevus which fades readily upon pressure should respond to two forty-minute exposures, providing the connective tissue is not thickened. Those that will not fade readily upon pressure may require four forty-minute exposures. These figures are not arbitrary, but approximate. Some of these lesions may require more and some less.

Healthy skin is more susceptible to the ultra-violet rays than skin which is congested, hence it is necessary to well protect it. This can be done by allowing the area under treatment to remain uncovered and protecting the surrounding normal skin by strips of zinc oxide adhesive plaster. The operator's hands should be protected with gloves. In a few hours the area treated turns slightly darker in color and there may be a moderate degree of swelling and edema. A fine network of darkened capillaries can be seen running through the nevus. The reaction becomes gradually more intense for about forty-eight hours, when it begins to subside. Slight desquamation of the skin takes place, and in from one to two weeks the nevus is seen to be markedly lighter in color. A second treatment may be given at the end of three weeks, and after each treatment the nevus grows still lighter. For several months after these treatments the lesion will continue to fade. In two cases the patients lived out-of-town and could not return in three weeks, the usual period between treatments. I was surprised to note after several months the great improvement that had taken place, more than could be expected in three weeks. The swelling which takes place after treatment is caused by pressure as well as by the action of the rays. After the first treatment the skin is not quite as susceptible to the rays as it was originally, hence to create exactly the same reaction as was formerly produced, the time of exposure must be lengthened, although this is not always necessary to attain the desired result.

INSTRUMENTATION.

The iron carbon lamps of the Finsen type which are used for generating ultra-violet rays are not practical for compression work. The Kromayer modification of the Cooper-Hewit mercury vapor generator is used by the writer and has been found to be practical for this purpose and to fulfil all requirements. The 110-volt direct current is employed to energize the lamp, but the alternating current may be used with a motor transformer. In this generator the mercury is contained in a quartz encasement, which is in turn enclosed in a metal receptacle, in which is provided an aperture for the rays to escape. This instrument is portable and can be easily handled. Quartz lenses of various sizes may be fitted in the opening, and the lens pressed firmly

against the part to be treated. There is no sensation felt by the patient during treatment except the pressure. There is a rheostat to regulate the intensity of the rays, but they are usually given full strength. It is necessary to have a continuous circulation of water around the quartz containing the mercury, else the lamp will quickly burn out, and may burn the patient. This is done by means of two rubber tubes, one an inlet and the other an outlet, carried from a spigot and returning to a drain or some receptacle. The lamp should be kept clean; if a film of carbon is allowed to accumulate on the quartz it will interfere materially with the amount of rays delivered, and may even retard them entirely. Two temporary failures in the writer's experience are attributed to this cause. The largest quartz lens that can be used with this generator measures 1¾ by 1¼ inches, hence this is the largest sized area that can be treated at one sitting.

TECHNIQUE.

There is no limit to the number of areas that can be treated in one sitting, unless the patient becomes fatigued. The area is mapped out with adhesive plaster. When a second area is treated at the same sitting, care should be taken not to expose a portion of the first area twice. If a large lens is used to treat a small area, it may overlap the adhesive plaster without danger. The eyelids may be treated, but care should be taken not to expose the cornea, or damage may be done. It is a wise precaution to protect the eyes during all treatments by goggles or other suitable covering. If the lesion is on the face or in some region leaving the arms free, patients, after protecting the hands with gloves, may hold the lamp; in fact this is desirable, as they can regulate the pressure very well after instructions. In the case of children, of course, another must apply the treatment. Experience has taught that it is better to give thirty- to forty-minute treatments if possible. Longer than forty-minute treatments may possibly be given to advantage in some cases, but forty-minute exposures are the longest the writer has ever given. If short exposures, say twenty minutes, are given, a greater number of treatments will be necessary.

CASE HISTORIES.

Case 1.—Referred by Sisters of St. Agnes Hospital. Girl, octoroon, seven years of age. "Port-wine" nevus on left side of face, involving eyelids, nose, cheek, and upper lip; also several areas of telangiectases. No fading upon pressure. First treatment August 11, 1914. Six twenty-minute exposures of each area were given, averaging three weeks apart. Both "port-wine" mark and telangiectases very much improved, but will require more treatment. This case did not respond as readily as some others, which was found to be due to carbon coating on the quartz, and pigmented skin.

Case 2.—Private case. Male, aged twenty-five, brunette. Deep purple-red congenital "port-wine" nevus on left side of face, involving eyelids, nose, and lip. No fading under pressure. The nevus was studded with small erectile angiomas, which were successfully treated by the desiccation

CASE 2.—Nevus flammeus studded with small erectile angiomas.

method. First ultra-violet radiation September 3, 1914. Six twenty-minute exposures of each area were given, averaging three weeks apart. The nevus became lighter in color after each treatment, and

at the present time there is slight evidence of the mark, the skin remaining soft and smooth. An interesting feature of this case was a marked enlargement of that portion of the lip involved by the nevus, which became almost normal in size after treatment. This patient had been treated by chemical caustics without success, which resulted in some scarring. These scars were very much improved by the ultra-violet treatment.

Case 2.—Showing result after ultra-violet radiation, and desiccation treatment of angiomas.

Case 3.—Referred by Dr. W. S. Howell, Winnebago, Ill. Male, aged forty, blond. Congenital reddish-blue "port-wine" nevus on left side of face, involving upper and lower eyelids, lateral aspect of nose, the cheek midway to ear, to below the corner of the mouth and half the upper lip. Another similar nevus ½ by ¾ inches in diameter just anterior to the ear. Slight fading under pressure. First treatment January 14, 1915. Four twenty-minute exposures of each area were given, averaging two weeks apart. After each treatment there was great improvement. This patient returned for inspection eight months later, when only the faintest pinkish tint was to be seen. Another twenty-minute exposure was given, and at the present time there is little evidence of the original lesion. Lip was thickened, as in Case 2, and became almost normal in size after treatment. The patient had been treated previously by electrolysis and carbon dioxide snow without success, and resulted in scarring. As in Case 2, the scars were very much improved.

Case 3.—Nevus flammeus before treatment.

Case 3.—Showing result after ultra-violet radiations.

In a letter from the patient he uses these words: "Treatment of my nevus was a complete success. Upon returning home most of my friends and relations needed an introduction to me."

Case 4.—Referred by Dr. C. F. Adams, Trenton, N. J. Male, aged twenty-two, brunette. "Port-wine" nevus involving lower left side of face, chin, and neck. No fading under pressure. First treatment January 3, 1915. Three twenty-minute exposures of each area were given, averaging two months apart. Improved, but still under observation. Not quite as much improvement as ordinarily takes place with this length of exposure, but this was also due to carbon on quartz lens, and dark skin, as in Case 1.

Case 5.—Referred by Dr. J. A. McCullough, Steubenville, Ohio. Child, male, ten months old, blond. "Port-wine" nevus right side of face, involving the eyelids, nose, lip, cheek, ear, and forehead. Faded upon pressure. First treatment January 29, 1915. Two twenty-minute exposures to each area were given two months apart.

A letter from the father states there has been much improvement. Further treatment will be given.

Case 6.—Referred by Dr. R. P. Cummins, Philadelphia. Child, male, six months old, blond. "Port-wine" nevus tip of nose. Faded upon pressure. One fifteen-minute exposure, March 19, 1915. The nevus was practically obliterated. The happy result obtained in this case by one fifteen-minute exposure was probably due to the thin skin possessed by a child of six months, and consequently greater activity of the rays.

Case 7.—Referred by Dr. W. B. Snow, New York City. Woman, aged thirty-five, brunette. This patient had a deep-red "port-wine" mark on the lower left side of face and neck, covering an area of four by five inches. She had previously been treated by the Roentgen rays. It did not improve the "port-wine" mark, but superimposed upon it severe telangiectases, pigmentation, and atrophy of the skin. One thirty-minute exposure of ultra-violet August 31, 1915, has improved the condition very much. It has not only almost cleared up the "port-wine" mark and the pigmentation, but the telangiectases caused by the Roentgen rays have been obliterated, and the atrophied skin has a much improved appearance. One more treatment will be given this patient.

Case 8.—Referred by Dr. W. W. Silvester, Norfolk, Va. Woman, aged twenty-six, brunette. "Port-wine" nevus on left side of face, involving eyelids, nose, cheek, and upper lip, extending to the neck. First treatment September 23, 1915. Two twenty-minute exposures were given. Condition improved; still under treatment.

Case 9.—Referred by Dr. L. Raring, Philadelphia. Female, aged twenty-four, blonde. "Port-wine" nevus on left side of face, involving eyelids, nose, cheek, and lip, fading slightly under pressure. First treatment November 15, 1915. Two twenty-minute exposures of each area, averaging two weeks apart, resulted in almost complete obliteration of the lesion, leaving the skin soft and smooth. Another treatment will be given, which is expected to obliterate the lesion entirely. This case had been treated previously by carbon dioxide snow without result. There was some scarring, and the ultra-violet treatment improved the scars, as in Cases 2 and 3.

Case 10.—Referred by Dr. W. C. Posey, Philadelphia. Girl, aged eight years, blonde. "Port-wine" nevus on right side of face, four inches long and two inches wide. Faded upon pressure. One thirty-minute exposure February 2, 1916. This nevus has faded about one-half. Treatment will be continued.

In addition to the lesions reported the writer has found the ultra-violet rays applied with the technique described to be most successful in such vascular lesions as lupus erythematosus, eczema rubrum, and acne rosacea.

CONCLUSIONS.

My experience with filtered ultra-violet rays by the compression method in the treatment of nevus flammeus and allied skin lesions has led to the following conclusions:

1. "Port-wine" nevi, telangiectases, rosacea, and other superficial vascular skin lesions may be treated with good cosmetic results.

2. Powerful ultra-violet rays with screens to filter out the red, yellow, and green, and compression by means of a quartz lens, are necessary for success.

3. The treatment will improve scars caused by caustic agents sometimes used to treat these lesions.

4. Failure may be due to imperfect technique, carbon adhering to the quartz enclosing the mercury or to the lens.

5. Nevi which fade upon pressure respond more rapidly than those which do not fade, though both types are quite amenable to treatment. All nevi do not react with equal promptness. When there is a complication of thickened connective tissue, prolonged treatment is necessary.

6. Young children respond more rapidly than adults, because the skin and vessel

walls are thinner and less mature, hence the activity of the rays is augmented.

7. Enlargement of features, such as lip, nose, etc., due to blood engorgement, sometimes complicating "port-wine" nevi, are reduced by this method.

8. Brunettes require more prolonged treatment than blonds on account of the resistance offered to the rays by the skin pigment.

9. Healthy skin is more susceptible to ultra-violet rays than abnormal skin, and must be protected.

10. This is a safe method for patient and operator.

1809 CHESTNUT ST.

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AN OUTLINE FOR THE MANAGEMENT OF CARDIAC CASES FROM THE OUT-PATIENT DEPARTMENT STANDPOINT.

The *Boston Medical and Surgical Journal* of January 20, 1916, contains an article by WENTWORTH in which he well says that the most important drug in the treatment of cardiac affections is digitalis. Fraenkel, Schwartz and Cloetta have shown that, in therapeutic doses, digitalis has no effect upon the normal heart either in affecting the strength of the beat or in causing hypertrophy; neither has it any effect upon perfectly compensated undilated hearts with a valvular lesion. Its chief effects are seen in dilated hearts whose myocardium still retains some reserve power. In the severest forms of cardiosclerosis and fatty degeneration it may stimulate the fibers to the limit of their powers and thus do actual harm. In giving digitalis it is important to get a definite effect and not to push the drug beyond the first stage of its activity—*i.e.*, slowing of the pulse and increasing its size and to avoid the onset of the second stage (arrhythmia).

As hearts vary in their susceptibility to digitalis, and since it begins to act only after twenty-four hours and may have a cumulative effect, the amount and frequency of the dose is not a simple problem. Its effect must always be carefully watched, and if the rhythm becomes more irregular it must be discontinued. When any disturbance of the conductivity occurs it is positively contraindicated. It is useful, first, in cases with broken compensation; secondly, in cases in which acute dilatation persists in spite of rest; thirdly, in persistent tachycardia which does not yield to other treatment. It is contraindicated in cases of heart-block and in cases in which the heart muscle has been diminished by myocardial changes.

There are some cases which show some signs of circulatory weakening and yet which do not seem to require digitalis. In these cases strychnia and camphor are used with good results. Strychnia is particularly valuable in cases of disturbed respiration following extreme heart failure, as in Cheyne-Stokes breathing and cardiac asthma. In such cases it should be used whether digitalis is being given or not. Camphor, like strychnia, is a vasomotor stimulant. Its most important use is in shock. (Best used as camphorated oil in 20- to 45-minim doses.)

Caffeine, like digitalis, acts upon the cardiac muscle, and raises the blood-pressure by constriction of the peripheral blood-vessels, and is therefore particularly valuable in conditions of shock and collapse. In this regard it is more valuable than camphor or strychnia, but unfortunately it is often accompanied by palpitation, sleeplessness, and even nausea, vomiting, and

delirium, which occur particularly easily in cases of heart disease.

Aconite in therapeutic doses slows the heart by stimulation of the vagus, but has little effect on the heart muscle. It is therefore of value in fevers where the heart muscle itself requires no stimulation, but the heart needs slowing. It is of value in many cases of tachycardia, especially those of nervous origin.

The nitrites are ideal in many cases to relieve the work of the heart over short periods where the blood-pressure is not already too slow to admit of their use. Nitroglycerin must be used with the utmost caution, as individual susceptibilities vary greatly. Loeb reports a case of collapse after a dose of a hundredth of a grain, whereas Stewart has reported giving 20 grains a day to a single patient.

The home regulation of a case is the most difficult to manage, but much may be done if the home facilities are not impossible and the family are willing to coöperate. A room can usually be obtained where the patient may be left in comparative quiet and lie down for periods of rest both morning and afternoon, the length of time depending upon the cardiac condition and the degree of patience which the patient has for keeping quiet under these circumstances. In cases of broken compensation the only place for them is bed, and bed 24 hours out of 24. When compensation has been established it is wiser to give the patients a few simple resisting movements a few minutes a day or several times a day for a few days than to run the risk of their getting up, for Wentworth has found that if they are once allowed to get up it will be hard to keep them from overdoing it at first and a great hardship to have to go to bed again. Each case must be regulated to its own ability to do work—*i.e.*, to be about. The first work to be taken up beyond the resistance exercises is walking. This must be very short at first, until the power of the individual is learned; then the amount is gradually increased.

The diet in the severer cases, in which bed treatment is required, is all-important. An increase in blood-pressure becomes manifest within a few minutes after the ingestion of a meal, reaches its maximum within one or two hours, and declines more slowly. The pulse-rate is always distinctly increased by eating; therefore the diet should be light, just enough to keep up nourishment, without ever causing a sense of fulness or allowing gas to form. Gas in the stomach pushes up the diaphragm and embarrasses the action of the heart, causing decreased systolic output and an increased rate. The lacto-cereal diet is best. This is made up of milk, eggs, custards, junket, crackers, zwieback, and toast. Most of the prepared cereal foods are good, since they give much nourishment with small bulk and are easily digested. Meat should be given sparingly, if at all, because the purin bodies tend to raise the blood-pressure and the fibers are relatively slow of digestion.

In cases of edema liquids should be limited to three pints a day. Salt should be withheld as much as possible, as it is a contributing factor in the production of edema.

An excellent diet for heart cases of a severe form (Widal and Pavel, Strauss and Richter), which can be modified to suit the individual case, is as follows:

8 A.M. Cereal, soft egg, toast, coffee, 6 ozs.
10 A.M. Milk, 6 ozs.; soft egg, crackers.
Noon. Soup, chicken, potatoes.
4 P.M. Milk, 6 ozs.
6 P.M. Milk, 6 ozs.; soft egg, crackers, prunes.
9 P.M. Milk, 6 ozs.; bread.

In the less severe cases it is well to have the patient lie down for at least fifteen minutes after each meal and for a full hour morning and evening. In order to be sure that this is carried out a definite hour should be selected, say from 11 to 12 and from 2 to 3, and have the one responsible show a list of the food, with the amount eaten, as well as the actual hours in bed.

As to recreation, the patient, if possible, should be kept off the street, even in the milder forms. Comparatively quiet yards or porches out-of-doors are often obtainable.

EDITORIAL.

THE TREATMENT OF SYPHILIS.

This subject, like that of anesthetics, is constantly discussed with great advantage and, very properly, is never exhausted because our advance in knowledge gives us clearer conceptions of the various phases of the disease and because syphilis is capable of affecting practically every tissue of the body. Many persons have thought, in the past, that once a diagnosis of syphilis was made the treatment was a comparatively easy proposition, and that if the mercurials were freely administered all was being done for the patient that was possible. If he steadily improved, the physician congratulated himself and his patient; if he failed to improve, the physician consoled himself with the thought that the virulence of the infection, or the feeble resistance of the patient, made a cure impossible.

It has become increasingly manifest in regard to syphilis and the remedies which are employed for its control, as it long since became manifest in regard to digitalis in the treatment of heart disease, that fully half of the benefit which can accrue by treatment depends upon the skill and judgment with which the proper drugs are employed. In exactly the same way that he who operates frequently for cataract or appendicitis will obtain better results than he who rarely operates for these conditions, so will better results accrue when antisyphilitic remedies are administered by men of experience than when they are employed by those who have had little opportunity to study their effects.

A good illustration of this point of view is offered in an article contributed to the *Boston Medical and Surgical Journal* of February 10, 1916, by Morton Smith, who states that some years ago a patient was sent from the medical to the dermatological department of a hospital with a note which read, "Has this patient got syphilis? If so, send her back and we will treat her," thereby intimating that a general medical man considered himself the equal of the specialist in the treatment of a dangerous and virulent disease. Of course, it is quite possible for the general medical practitioner, by reason of his experience, to be skilful and successful, but the general proposition is that the syphilologist is better equipped.

The epoch-marking discovery of Noguchi, to the effect that the microörganism of syphilis is to be found in the perivascular tissues in cases of paresis and often late syphilitic manifestations, has thrown a flood of light upon the general subject of the cure of syphilis. Not only has it proved that paresis and ataxia are, in the vast majority of instances, due to this infection, but it has also proved that mercury is not the absolute specific that it was at one time thought to be, and that the old statement that "three years of mercury meant a cure" is entirely erroneous. On the contrary it may well be that the use of mercury may actually develop in the body a strain of spirochætæ which are immune to its influence, just as the use of small doses of quinine may, in the end, result in a brood of malarial parasites which no safe dose of quinine can destroy. Furthermore, Noguchi's work has led to the discovery that even intravenous injections of salvarsan cannot reach the spirochætæ in the cerebral tissues, and, barring the employment of the so-called intraspinal injection of salvarsanized serum, syphilis of the central nervous system is as incurable to-day as it has ever been. While it is true, therefore, that late syphilis is extremely difficult to cure, it is equally true, as with all other infectious diseases, that its early recognition and active treatment afford the best opportunity for the complete relief and cure of the patient. It is to be regretted that we have no accurate scientific test for the discovery of the very early infection by syphilis, since the Wassermann reaction does not appear until general systemic infection has undoubtedly occurred. Of course, he who is skilful with his microscope can in a considerable proportion of cases obtain from the site of the initial lesion the specific parasite which, when

properly stained, can be recognized, and so the diagnosis can be made to rest upon a scientific basis. Because the parasite is not found when looked for does not prove that the case is not one of early syphilis, for, as with the examination of sputum for the tubercle bacillus, if found the diagnosis is positive; if absent the result only means that the parasite was not found, although it may be present.

If the diagnosis of early syphilis is so difficult the universal use of prophylactic measures is manifestly the first step toward eradication of the disease. The use of prophylactic measures before coitus fails for obvious reasons, but it has now been proved beyond all doubt that the employment of a thirty-three-per-cent calomel ointment thoroughly rubbed into the site of possible inoculation within one hour after exposure is an efficient and complete prophylactic measure. Its value has been proved in all the armies and navies of the civilized world, including our own, and it only remained for the Secretary of the Navy to issue an order forbidding the issue of the prophylactic package for fear that he was encouraging immorality if it was dispensed, to have an increase in the prevalence of syphilis occur. By an inadvertence he has aided in establishing a scientific fact, and by misunderstanding conditions he has aided in the spread of virulent disease and in a decrease in fighting efficiency.

A very important point to be borne in mind by the clinician who is brought face to face with this disease is the fact that neither salvarsan nor mercury is adequate by itself to produce a cure. The best results are undoubtedly obtained by the employment of both of these drugs, and it is to be regretted that so high an authority as Wechselmann should have enunciated the view that to employ salvarsan when mercury had been used was dangerous. Most syphilographers now agree that the repetition of the intravenous injections of salvarsan or neosalvarsan every ten days should be accompanied by the daily administration of one of the mercurials by the mouth; or, in other instances, by the intramuscular injection of mercury once a week, usually in the form of one grain of salicylate of mercury. This treatment should be continued until the Wassermann reaction is negative, when a period of three or four months may elapse without any treatment. If the Wassermann reaction is positive at the end of this time, or if a small provocative dose of salvarsan makes it positive, the treatment should be renewed. If not, on general principles mercurials should be administered for three or four months and another test made.

A very important factor in the cure of syphilis, which receives far too little attention, is the recognition that, as it is in its early stages an acute infectious disease, everything should be done to improve and maintain the general health of the patient. We have come to fully appreciate the full value of fresh air, sunshine, and good food in the treatment of every infection save, perhaps, that of syphilis, and undoubtedly one of the reasons that syphilitics who go to various health resorts for treatment speedily improve, when they have failed to improve while at home, is, in many cases, dependent upon the fact that they are placed in favorable hygienic conditions and, therefore, are the better able to combat their disease. Rest, which markedly increases vital resistance and is therefore essential, is obtained, and when a line of drug treatment which has been correct in theory is duplicated at such a health resort favorable results are produced.

The appalling result of this disease, not only to the patient himself but to those of his or her descendants that survive, and the fact that carelessness in its early stages may result in wide-spread diffusion of the infection, ought to stimulate medical men, health officers, and legislators to a constantly increased vigor of campaign along the line of sexual hygiene, along the line of knowledge as to prophylaxis after exposure, and by a general diffusion of the information that prompt, early, and vigorous treatment affords the only hope of permanent cure.

In ancient times that very feebly contagious malady known as leprosy was treated

prophylactically, for the cry which came from every one's lips when the leper approached was "Room for the leper, room!" The prevalent ideas of syphilis stand in the way of such a custom in modern times, and possibly this popular feeling is wise, but the poor wretch with leprosy is as feeble in conveying infection, as compared to the active case of secondary syphilis, as the bite of an ant is capable of doing harm when compared to the bite of a lion. The conditions are such that a patient with active secondary syphilis is allowed to wander from hospital to hospital, or from office to office, as freely as a healthy citizen. As a matter of fact the greatest value which has come from the introduction of salvarsan is that the patient can, to a very large extent if not completely, be sterilized so far as the spread of the disease is concerned.

DIET IN CHRONIC HEART DISEASE.

There can be no doubt that many physicians do not pay sufficient attention to the question of the patients' diet when they are treating them for diseases not necessarily associated with disordered digestion. If for no other reason, attention should be paid to this matter because patients expect it and, if dietetic advice is not given, they may think that the physician is careless. By a curious condition of affairs it would seem probable at this time that advice as to diet is given in connection with certain conditions where it is not particularly essential, and is not given in other conditions where it possibly is the greater part of the treatment which is to be followed. Where there are disturbances of the digestive function in the stomach or intestines it, of course, is necessary that certain foodstuffs should be excluded, and in all conditions of disease it is obvious that foods which are difficult of digestion should not be given the patient, since they demand greater energy for their digestion and absorption than easily digested foodstuffs and, by causing indigestion, may produce complications in the intestinal tract or in the cardiovascular system which are disadvantageous.

We think that the institution of a very limited diet, both as to the variety of food and the quantity which is taken, is rarely necessary in cardiac disease so far as the cardiovascular condition is concerned. If the liver is engorged and, as a result, there is impairment of digestion with gastroduodenal catarrh, it goes without saying that very small amounts of easily digested foods are essential, just as they are needed when digestive disorders of a primary nature are present. The use of very limited quantities of food means that the patient has to feed upon himself in order to get the number of heat units in each twenty-four hours which are essential for his existence. This is a point which is too frequently ignored. It is generally admitted that from 1500 to 2000 calories are required by an adult in each twenty-four hours in order that he may carry out his ordinary physiological functions without doing any work or taking any muscular exercise. If a diet is given which contains less than this number of calories the body turns upon itself and uses up its own tissues, so that eventually distinct emaciation occurs. The healthy man who is deprived of food for a few hours beyond the time when he is accustomed to taking it not only feels hungry, but soon feels faint, and if this is true for the man in health it must also be true for the man whose circulation is impaired.

In the majority of cases of heart disease, whether they be instances of ruptured compensation due to valvular lesion, or failing circulation due to myocardial degeneration, the chief endeavor of the physician is to put more strength into the heart muscle, and we fail to see how an exceedingly low diet is compatible with this effort. It certainly would not be considered compatible with an effort to increase muscular strength in other parts of the body. Food easy of digestion frequently administered, or food which is predigested and frequently administered, will often produce the best results, since the taking of two or three hearty meals may, by giving the digestive apparatus a difficult task, also require of the circulatory system too great activity. For this

reason we differ from Satterthwaite, who writes in the *Interstate Medical Journal* for January, 1916, that a fundamental rule which is always applicable is that the diet should be sparing. So, too, we think that the statement that coffee and tea should be prohibited, and that most of the advertised substitutes for coffee are also objectionable, is too dogmatic. The statement is also made that chocolate is an undesirable beverage for heart patients as it is constipating, and, finally, emphasis is laid upon the statement that liquids, if given freely, are an additional burden to the heart. With these views we also fail to agree.

So far as we know, there is little or no evidence to indicate that coffee and tea, when taken in moderation, are disadvantageous in cases of heart disease. On the contrary there is much evidence, particularly in the European clinics, that caffeine is a valuable cardiovascular stimulant, and caffeine, of course, is the chief ingredient of coffee and tea. The theobromine, which is found in chocolate, is more diuretic than caffeine, and, unless the patient shows an idiosyncrasy or is unable to digest rich or fatty substances, we can see no reason why he should be deprived of chocolate, although, perhaps, cocoa, being less rich, is a better drink.

We heartily agree with the statement made by Dr. Satterthwaite to the effect that each patient is a law unto himself and that individual idiosyncrasies must be carefully taken into consideration in the dietetic treatment of all cases, but we also feel strongly that unless there are exceedingly good reasons for the institution of rigid dietetic measures they ought not to be attempted. Aside from being inconvenient and tantalizing, the institution of a rigid dietary, by which a patient is deprived of something to which he has been accustomed for years, causes actual mental and physical discomfort and, in a very considerable number of cases, actual harm. A man who has been accustomed for thirty or forty years to have a cup of hot coffee, tea, or cocoa with his breakfast is actually punished if these things are forbidden him, and not only loses the comfort but the effects of the alkaloids which his breakfast cup contains; and his digestion, which for years has been trained to this stimulation, often fails in its function when the only beverage allowed him is cold water or hot milk, the latter being exceedingly distasteful to some people, and certainly much more constipating than cocoa or chocolate.

Even when chronic disease of the kidneys is present to a moderate extent it is questionable whether the institution of a rigid diet is the best thing for the patient. If the man has only a short time to live the human question arises as to whether the institution of a rigid diet will really prolong his life, and if it will not, whether his remaining days should not be as comfortable as possible. We have repeatedly seen persons who were inevitably condemned to death within a few weeks, by reason of cardiovascular or renal disease, made miserable during their remaining days by the institution of rigid, but not essential, diet rules.

While writing this leading article our attention has been also called to a contribution by Abrahams to the *New York Medical Journal* of Jan. 15, 1916. We are glad to see that, to use his words, he indulges in personal comforts instead of calculated calories borrowed from others, that he cherishes a wholesome respect for a patient's palate and preference in the matter of diet, unless there is some extraordinary reason for ignoring them, and he recognizes that a stereotyped diet tries a patient's soul as well as his stomach. It goes without saying, as he well points out, that the mere existence of a valvular murmur, accompanied by good compensation, does not justify any regulation of the diet, unless the patient is such an abnormal eater that he should be warned against gluttony on general principles. We are glad to see that where there is ruptured compensation he believes that food may be taken with impunity and of almost any kind, provided that instead of three large meals a day he takes six small ones. This is in line with the opinion which we have already expressed in this note. We think that

Abrahams also is wise in considering that the etiological factor in the production of the cardiac lesion has possibly more to do with the regulation of the diet in heart disease than the actual lesion which is present. Thus, in gouty persons it is obvious that foods which are notoriously gouty, like concentrated soups, various forms of game, liver, sweetbread, and other substances, are to be avoided.

We cannot agree with him that in acute articular rheumatism, involving the heart, patients bear red meat badly, unless it be during the febrile period, when it is questionable as to whether meat in any form is wise. On the contrary, acute articular rheumatism, being an infectious disease particularly prone to produce profound anemia and feebleness, indicates, when the period of convalescence is established, even if the heart has been badly touched, as full diet as the digestive system of the patient can manage.

Again, we think the opinion expressed by Satterthwaite, in the article already quoted, and the view expressed by Abrahams, to the effect that the free taking of liquids increases the labor of the heart, are not based so much upon actual observation as upon the general impression which seems to be common throughout the profession. Of course, the presence of renal disease, which prevents the free elimination of fluid and which aids in the circulatory break-down inducing dropsy, is manifestly a contraindication to the ingestion of large quantities of fluid, since, although the liquid gets in easily, it escapes with difficulty. The commonly held view that the drinking of fluid particularly increases the labor of the heart by increasing the volume of liquid in the blood-vessels is, we think, erroneous; if it were true the specific gravity and corpuscular content, as well as the tonicity of the blood serum, would be constantly changing. This we know to be contrary to the fact. There is no part of the body which is guarded so zealously by nature as the blood. Various mineral substances when placed in the stomach are either not absorbed, if the blood is carrying all of them that it can, or, if taken up, are eliminated so speedily by the kidneys that the content in the blood stream is never materially altered. The same thing holds true of water. It is either not absorbed, or, if it cannot be rapidly passed out by the kidneys, it is deposited in the tissues until it can be eliminated. The mere drinking of water does not, therefore, increase the bulk of the circulatory stream.

By this we do not mean to advocate that patients shall be allowed to distend the stomach by large amounts of water taken in an individual drink. The point that we wish to emphasize is that there is no necessity in cardiac disease, if the kidneys are competent, of forbidding the patient a sufficient amount of liquid, in small divided doses, to allay his thirst and make him comfortable. If the cardiac muscle is so weak that an adequate circulation cannot be maintained the fluids should be cut down, not so much because they add to the actual bulk of fluid in the blood-vessels at a given moment, as because the impaired circulation interferes with the function of the kidneys and prevents the elimination of fluids, which are then deposited in the tissues, producing edema, which is manifestly disadvantageous. This edema in many instances can be relieved, from time to time, by the use of hydragogue cathartics without causing the patient to suffer from thirst through the denial of liquids taken by the mouth.

THE ACTION OF BITTER TONICS ON THE SECRETION OF GASTRIC JUICE.

One of the most commonly accepted opinions amongst medical men is that the administration of the so-called bitter tonics is beneficial, in the treatment of convalescence from acute diseases, in that they aid digestion by increasing the tone of the gastric mucous membrane or by causing more free secretion of gastric juice. Such tonics are also very frequently given in cases of general debility and impaired digestion arising from ill health due to other causes. Not long ago these views seemed to receive a serious blow because of an

investigation by Carlson, who, administering bitters to normal men and normal dogs, found that they had no effect which was advantageous, and that sometimes there was a diminution in the quantity and quality of gastric secretions rather than an increase. As Carlson's experiments were carried out over a considerable period of time they possessed weight, although, of course, it is not to be forgotten that as his experiments were made upon men or animals in health they are not necessarily a guide as to the effects of these substances in ill health.

It is interesting to note that acting under the instigation of Carlson, Moorhead (*Journal of Pharmacology and Experimental Therapeutics* for December, 1915) has carried out another series of investigations in which he used not normal but abnormal conditions, well recognizing that certain drugs do not elicit their specific action except in pathological states.

As we have pointed out in other leading articles, the time has come when we should have experiments not only upon healthy men and animals within justifiable limits, but also should have records of the influence of drugs in various conditions of disease; and it is an encouraging sign of the times that laboratory workers are beginning to recognize the fact that practitioners of medicine cannot be guided alone by experiments upon healthy tissues, although such experiments deserve support and recognition in that they give us clearer conceptions in regard to the effects of drugs in general, and because it is essential that we should have information in regard to the action of drugs upon healthy as well as upon unhealthy conditions. It is also interesting to note that Moorhead fully recognizes the fact that the skilled practitioners of to-day believe that the employment of bitter tonics in suitable cases does improve the condition of the patient. He asks the question, however, as to whether they stimulate the appetite, the gastric secretion, or both, or is their action purely psychical?

In Moorhead's study of the action of bitters upon normal dogs he found that whether these drugs were given by the mouth or sent directly into the stomach they had no appreciable influence upon the appetite nor any material effect upon the gastric secretion, either as to quantity or quality, except possibly a diminution of total acidity. So far his results are in accord with the early ones of Carlson. Using dogs which were in ill health because they suffered from chronic anemia which was artificially produced by repeated bleedings, he found that these bitter tonics acted in quite a different way, since they exerted a distinctly favorable influence upon the appetite, although the animal did not consume an amount of food which was equal to the normal because of its feeble condition. He states that there can be no question that the influence of these bitters is definite and significant. When given by the mouth they cause both an increase in the quality and quantity of the gastric juice, the pepsin content remains fairly constant, and the change is both in the free and total acidity. Here, again, the amount of gastric juice was not up to the normal, but nevertheless it was above that which was secreted without the influence of these drugs.

Another interesting point developed by Moorhead is that these bitters introduced directly into the stomach of cachectic dogs have no appreciable influence upon the quantity or quality of the gastric secretion, which would seem to indicate that the secretion is caused reflexly through the nerves of taste and not by any direct stimulation of the stomach itself.

THE FOLLOW-UP SYSTEM.

Although to the visiting chief, and this particularly if his services be used in teaching students, the function of a hospital would seem to be educational, the institution was originally started and was endowed for the benefit of the patient, nor are its by-products of any large service unless its fundamental purpose is kept clearly in view. It is obvious that no clear knowledge can be obtained concerning the benefits derived from hospitals unless there

be made a systematic effort to determine how efficient the treatment given in a hospital was to each individual; success being gauged not merely by correspondence between diagnosis and pathological findings, but by the final test of the complete relief of the crippling symptoms for which the patient originally entered the hospital and the return of that patient to the highest possible degree of permanent health.

It follows then that the first step toward greater efficiency lies in a comprehensive and thorough study of the results, and that these results can be obtained only by learning the condition of patients after they have left the hospital. Hence all efforts at what is called the follow-up system logically lead not only to the greater benefit of the hospital patient but to improvement in hospital administration in all its departments, and particularly in the departments of diagnosis and treatment. In this relation the contribution of Corscaden (*Journal of the American Medical Association,* March 11, 1916) is of importance as setting forth in some detail the method pursued in the Presbyterian Hospital in New York. This lies essentially in prevailing on the patient to return. On his discharge from the hospital he is given a card on which is written a definite date and hour for his reëxamination. If he does not appear he is sent a card making an appointment for a week later. Should he again fail to return he is taken up by the social worker, who visits him and endeavors to have him return, and failing in this obtains as complete information about him as possible. The practical working of this system must depend, of course, upon an adequate history taken in the first place, and upon an accurate description of the patient's condition on leaving the hospital. Moreover, the interest of the attending surgeons must be secured. It is the custom to notify them by mail of the various appointments for the next examining day of the patients whom they have treated in the wards. During convalescence an attempt is made by the visiting and resident surgeons and the nursing staff in conversation to impress the patient with the importance and desirability of returning to the hospital for subsequent examinations.

Corscaden gives the forms of cards employed in both the follow-up and record systems. Two classes of reports are turned in by the social workers, first (*a*) a medical report in which sufficient data are given for determining the present clinical result, and (*b*) an "incomplete" report which, although not containing complete medical information, gives some knowledge of the patient's earning capacity, general health, etc.

The personnel required has consisted of one full-time assistant clerk in the record room, two assistant visiting surgeons working three hours a week each, and the full time of a social service worker. One assistant surgeon is designated the "follow-up committee," and has general oversight of the follow-up work.

As to the results, 45 per cent responded to the card given in the ward, over 23 per cent responded to letter, and nearly 10 per cent to social service, this response being in the form of personal appearance for an examination at the hospital. Information was gained in over 14 per cent by letter or through social service, giving a grand total of 91.6 per cent about whom information was obtained—6.8 per cent being out-of-town cases were not followed; 1.6 per cent of cases were not found by any part of the system.

Corscaden holds that the results indicate what may be fairly expected in any city. The clinical data thus obtained are available for looking up either individual cases or classes of cases. Any case serious enough for hospital treatment is worthy of being subsequently followed. Indeed, it has been the so-called minor cases in which the greatest surprises in end results have occurred.

One of the most difficult steps in the work has been to convey to the patient the reason for the return. The majority of them come back for the first visit merely because they are asked to. The social ser-

vice worker finds that this lack of understanding is responsible for the failure of the majority of those able to return.

The factors working for success have been the obtaining of accurate addresses, particularly that of a friend having a fixed place of business, the giving to the patients of a clear understanding of the purposes of follow-up work, definiteness in appointments and directions, the demonstration of an interest in the patient as an individual rather than a "case," and a certain amount of despatch in handling the case when the patient returns for examination. One pleasing feature has been the recent referring of new patients by old ones "because they watch you so carefully afterward."

The results obtained by this method are surprising and most gratifying. Seventy per cent of returns has hitherto been regarded as fully justifying time and trouble taken in this study. As to the benefit accruing to both patients and staff there can be no question. Moreover, there is afforded by a study of these cases a true criterion by which ultimately may be judged the efficiency of each individual composing the staff.

INJURIES TO THE ANKLE.

With the more accurate diagnosis of fissures and breaks in the bone incident to better *x*-ray pictures, and with increased skill in their interpretation, has come a wider knowledge of the underlying lesions which account for the permanent crippling which too often follows such injuries about the ankle as we in former times called sprain, and treated as such. Even to-day there is a popular professional belief to the effect that fractures of the ankles are practically all of them Pott's fractures, or some modification of this injury, meaning by this term a tear of the internal lateral ligament, or a break of the inner malleolus with fracture involving the lower fifth of the fibula, allowing the foot to be displaced and rolled outward. There is too often, even in this injury, an unnoticed and untreated backward displacement of the foot accompanied by a breaking away of the inferior or inner posterior articular surface of the tibia and by a separation of the tibiofibular articulation.

The treatment of Pott's fracture lies in reduction of the displacement by carrying or rotating the foot inward, pulling it forward to correct the backward displacement, and in holding it in this position. An essential part of treatment when union is obtained and weight-bearing is allowed is that the inner surface of the sole be built up and the patient be instructed to toe forward until such time as the ligaments and muscles have regained a degree of strength and functional activity that assuredly prevents outward displacement.

The whole problem is a static one, the treatment being designed to restore the astragalus to such relation to the tibia that weight-bearing may be accomplished with the least degree of strain. A valgus, incident to inadequate replacement or retention, which develops later from early and unguarded use, is fatal to painless function, and the same may be said of uncorrected backward displacement. Indeed, any but the normal relation of the joint insures a permanently weak and painful ankle. After a foot injury, if a Pott's fracture or one of its modifications is excluded—nor is this difficult to do providing there be no such injury—the diagnosis of sprain is too often accepted and treatment adopted which almost inevitably leads to permanent and painful crippling. As a general rule any injury to the ankle incident to a twisting, levering, or crushing force, as from a high jump, for instance, is more than a sprain if it be followed by total disability, rapid and extensive swelling, and great pain. These symptoms are characteristic of bone injury, the swelling being due to the fact that bone bleeding, though slow, is persistent. This is also, in part, an explanation of the severe pain. Though not nearly so common as Pott's fracture, fracture of the astragalus is encountered sufficiently often to be worthy of careful consideration,

and is so habitually followed by lasting, painful disability that the proper recognition of the condition and its prompt treatment are matters of first importance.

Baudet (*Revue de Chirurgie*, Nos. 8-9, 1915) contributes a monograph on this subject from the historical, mechanical, and clinical sides, in which he points out that the fracture usually divides the astragalus transversely, forming anterior and posterior fragments. In accordance with the position of the break it is called fracture of the neck or fracture of the body. In fracture of the neck the line of break passes in front of the tibiotarsal articulation, and thereafter the callus resulting from healing is so placed as not to interfere with subsequent movements. In fracture of the body two articulations are involved. The tibiotarsal above, the astragalocalcaneal below and behind. Even after reduction there is danger of ankylosis. Moreover, in the great majority of cases it is complicated by a backward displacement of the posterior fragment. Concerning symptoms, if the neck of the astragalus be fractured without displacement the patient usually gives the history of falling from a height on his feet. He may remember that they were flexed. There is rapid and wide swelling involving the dorsum of the foot and the lower portion of the leg, filling the retromalleolar depressions. There is complete disability, and the whole foot is held in varus with a slight equinus. Careful examination fails to show bony deformity. Pressure immediately beneath the internal malleolus gives acute pain, though painful points are found throughout the swollen area, especially just in front of the astragalotibial articulation. When fracture of the neck is complicated by displacement the projecting bone is found in front of the astragalotibial joint. This deformity may present a simple projection or a true luxation of the anterior fragment. In fractures of the body similar symptoms exist, the foot is often subluxated anteriorly, and the projecting bone can be felt either in front or behind. The diagnosis is of course based on the careful use of the *x*-ray. Old fractures of the astragalus are characterized by partial or total ankylosis and bad position. The disability is likely to increase with use.

Baudet's paper deals largely with treatment. This lies in reduction, which must be controlled and modified by the *x*-ray. To be assured of a good joint, reduction must be extremely accurate. Thereafter immobilization for two to four weeks, and after this daily massage and passive movements; finally exercise and weight-bearing, the surveillance being continued for many months—indeed, more than a year is often required before these patients should be allowed to subject their joints to normal weight-bearing. Since the anterior fragment is often turned upon itself efforts at reduction may fail. As shown by eight cases reported in 1906 by Cabot and Finney, in six of these good function was not restored, and in two results are quoted by Baudet as being passable.

Where simple reduction is not accomplished as proven by *x*-ray pictures the open method is indicated, and if at all successful can be made absolutely accurate. At times it is unsuccessful. Partial or complete astragalectomy—*i.e.*, removal of the displaced head—has given results termed by the surgeon satisfactory. A total astragalectomy has apparently been followed by better results, but as a rule not by such as are entirely satisfactory to other than the surgeon, from which Baudet concludes that in all cases of fractured astragalus which cannot be satisfactorily reduced either by the closed method or through an incision, total astragalectomy is the method of choice, with a guarded prognosis as to ultimate function.

REPORTS ON THERAPEUTIC PROGRESS.

THE TREATMENT OF KALA-AZAR WITH TARTAR EMETIC.

MUIR in the *Indian Medical Gazette* for October, 1915, reminds us that in the *Tropical Diseases Bulletin* for April, 1915, there appeared a review of an article by G. Cristana and G. Caronia, who had successfully treated some cases of infantile kala-azar with tartar emetic after the publication by Gasper Vianna of cases of dermal leishmaniasis treated successfully with the same drug in South America.

Having at the time some cases of adult kala-azar, Muir at once began to treat them in the same way, and was surprised at the result. Indeed, with the exception of emetine in amebic dysentery he has never seen a specific work a more rapid and striking result in any disease. Up to the first week of August he treated twelve cases with tartar emetic, in nine of which the diagnosis was confirmed by finding the parasite in spleen punctures, and of these, with the exception of one who came in the very last stage, all have either recovered or are recovering.

The method of treatment is as follows: A one-per-cent solution is injected every second day intravenously. With a little experience this is done quite easily and practically painlessly, the smallest child even submitting to it without crying. Care has to be taken that none of the fluid escape into the subcutaneous tissues, otherwise a most painful swelling is produced. This can, however, be obviated by seeing that a thin stream of blood is running into the syringe before the piston is pushed home. The dose should begin with 4 Cc. and be increased each time by 1 Cc. up to 10, unless there are signs of nausea, when it should be decreased by 1 Cc. and then gradually increased again.

The writer has found, with the one exception mentioned above, that there is marked improvement after even the first injection, and after the second injection there is always a consuming appetite and the spleen is markedly decreased in size, while the color of the patient changes rapidly from a characteristic black color, which gives the name to the disease, to a normal color.

The writer still continues to use in conjunction with tartar emetic the turpentine intramuscular injection, which he used formerly alone, and finds that it increases the rate at which the spleen diminishes.

The turpentine injection consists of a solution of turpentine one part in camphor-creosote one part of each, and olive oil two and a half parts. Of this up to 10 minims is injected into the muscles of the back on either side of the body.

The writer has invariably noted that if such an injection is given to a patient at all advanced in the disease before the tartar emetic treatment is begun there is little or no reaction and swelling.

If, however, it is given after a week's treatment with tartar emetic, there is a very marked reaction, the part injected swelling and causing considerable pain. Spleen punctures taken at a week's interval show first marked diminution, and then complete disappearance of the parasites.

THE DANGERS OF ARTIFICIAL PNEUMOTHORAX.

WOODCOCK in an article in the *Edinburgh Medical Journal* for November, 1915, says we must consider certain dangers connected with this operation. These may be tabulated as follows:

1. Shock or irritation reflex—(*a*) as associated with every injury; (*b*) as a predominant symptom.

2. Injury to the lung by puncture, leading possibly to—(*a*) pneumothorax of the ordinary type; (*b*) hemorrhage; (*c*) embolism (gas or clot).

3. Injury to the lung by massive pressure from excess of gas in intrapleural space—(*a*) undue pressure on structures of the lung directly compressed (1) on alveoli, causing collapse of healthy tissue, and (2) on blood and lymph vessels, causing edema

of lung; (*b*) displacement of mediastinal contents; (*c*) pressure and loss of tonus of the other lung—a very important condition.

4. Inflammatory sequelæ to trauma of the tissue—(*a*) pneumonia; (*b*) pleurisy, with or without effusion; (*c*) septic infection of neighboring structures, mediastinal and parietal.

5. Excitation of disease elsewhere. Here overfunction of the other lung is referred to. This overfunction has no resultant ill effect if the septic cavities of the diseased lung are decreased in size, in which case both lungs are benefited.

From the experience gained in the Leeds hospitals the writer has come to believe that the mechanical danger of gas embolism has been much overestimated and unduly emphasized by continental writers and too readily echoed by our own. Shock has seemed the commoner mischance. He is not at all certain that the reflex is necessarily a pleurovagal cardiac reflex; it has seemed to be abdominal also. Many cases have been followed by diarrhea. In fact, shock is a central nervous exhaustion, and since the brain centers are disorganized, the shock is general. One lung injured may temporarily affect the other. The close connection between the tonus of the contents of the two cavities, thoracic and abdominal, only needs to be mentioned because it is so often forgotten. Abdominal tympanites in the later stages of pneumonia illustrates the relationship. The following experiment is of some interest:

At a post-mortem examination the writer tested the intrapleural pressure by penetrating the intrapleural space with a Saugman needle. The manometer registered a negative pressure of 1½ inches of water. He then opened the abdomen to a limited degree and tested the intestinal pressure with another needle and another manometer. This manometer showed a positive pressure of 2 inches of water—a positive fall. On freely puncturing the intestine and allowing gas to escape he observed an increase of negative pressure in the intrapleural space from 1½ inches of water to 3½ inches, while the positive pressure in the abdominal manometer disappeared. When the writer mentioned this matter to Dr. Gebbie he suggested a modification in the technique of artificial pneumothorax previous to operation—the use of an enema to empty the rectum, by which means hemoptysis cases might also be relieved.

Brauer and Spengler have collected the records of many fatal cases.

TOXICOLOGY OF EMETINE.

The *Journal of the American Medical Association* of November 13, 1915, points out that comparatively little has been added to our knowledge of the systemic actions of emetine in mammals during the past few years, and the descriptions in recent textbooks of its toxicology are much like those given by Lewin in 1888.

The following is based largely on the statements of Kunkel and von Jaksch:

Emetine is an active local irritant, causing inflammation, and even ulceration of the tissues with which it comes in contact in sufficient concentration. When powdered ipecac is handled, it may give rise to irritation of the eyes, and even ulceration of the cornea, and cause burning in the mouth and throat. The inhalation of the powder causes a sense of oppression in the chest and difficulty in respiration (so-called emetine asthma).

The application of an ointment containing emetine or ipecac causes irritation, progressing to pustulation with the continued application of strong preparations.

The subcutaneous injection of emetine causes pain, swelling, and even ulceration.

Emesis following the oral administration is generally attributed to the local irritant action on the gastric mucous membrane; if emesis fails to occur and emetine passes into the intestine, it gives rise to diarrhea, and this may be bloody, the latter effect being augmented by the extreme dilatation of the intestinal vessels. If absorption occurs, systemic effects follow.

The systemic effects observed after the entrance of emetine into the blood stream include general depression with failure of

respiration, due to paralysis of the center, and cardiac failure due to the direct action of the emetine on the heart and circulation. There is a profound fall of blood-pressure because of the cardiac and vascular effects.

The central nervous system undergoes rapid depression and paralysis even in the frog, which is not immediately killed by removal of the heart. Emetine stops the mammalian heart in diastole.

Alterations in the blood have been described; these are attributed to the accumulation of acid products of metabolism, but they are not responsible for the effects just described.

Kunkel describes the effects of from 50 to 100 mg. per kilogramme of body weight in the cat and dog, but the results of experiments performed in the laboratory of the writer (unpublished) show that as little as 2 mg. of emetine per kilogramme administered intravenously may cause general depression with weakened and accelerated heart and lowered blood-pressure. There is an apparent improvement after a short time, but usually these doses are fatal within forty-eight hours. The effects of the oral administration of emetine in solution are about like those seen after intravenous injection, but death may occur with general paralysis and cardiac failure within three minutes after the intravenous injection of large dose (15 mg. per kilogramme).

It is generally stated that emetine causes emesis only through its action on the gastric mucous membrane, but it also causes emesis after the intravenous injection into a dog from which the gastrointestinal tract has been removed; hence it is also capable of acting on the vomiting center directly.

One observer reported that vomiting, colic, abdominal cramp, and collapse occurred, followed by death within an hour and half after a patient had taken a large amount of wine of ipecac. Hyperemia of the stomach and duodenum were found at necropsy.

Several authors state that the toxicology of emetine is not very important, and von Jaksch states that the prognosis in case of poisoning by it is good. The diagnosis is made by finding the alkaloid in the vomitus.

Emetine is absorbed from the gastrointestinal tract when given in solution more readily than when administered in the form of a preparation of ipecac. Tannin, in the form of krameria, is recommended as the antidote in such cases.

The following observation of Kunkel is interesting in view of the date of his writing it and the use of emetine in hemoptysis at present. He says (1901) that it was formerly believed that emetine induced a specific anemia of the lungs, from which circumstance it was used in hemoptysis. He states that the belief probably arose from the observation that the pulmonary vessels of animals that had been killed with emetine were empty, which he explains as being due to the maximal dilatation of the vessels of the splanchnic area, with the consequent drainage of the pulmonary vessels.

This observation of Kunkel is at least worthy of attention at this time, in view of the fact that even small doses of emetine are capable of causing depression.

THE TREATMENT OF AMEBIC DYSENTERY.

In the *British Medical Journal* of November 13, 1915, Low tells us that since Rogers proposed the use of emetine for amebic dysentery he has treated many cases, both in private and in the Seamen's Hospital, by this drug, and the method of administration now given is therefore based on actual experience and is one that will be found useful and efficacious in actual practice. Other ways of giving the drug he has no doubt may prove equally successful—at any rate, in the hands of experts—but there are certain points that must be carefully followed if success is to be obtained.

Space will not permit a dissertation on all the varieties of dysentery met with. It is sufficient to say here that there are bacillary forms of the disease, protozoal forms, and helminthic. Of these the one termed amebic comes under the protozoal group, and is caused by a parasite termed the

Entamœba histolytica. The cases of dysentery that have recently reached England from the Dardanelles have, at least in the vast majority of cases, been bacillary, or of some undetermined type, and certainly have not been amebic.

The administration of emetine to such is useless, as this drug is only specific for the form of dysentery caused by the Entamœba histolytica just mentioned, and by its improper use in cases not due to such parasites negative results are obtained, and the drug is brought into disrepute. The first thing to do in dealing with a case of dysentery is to determine its type, and for this purpose the feces must be carefully examined for protozoal and other parasites. To detect pathogenic amebæ is not difficult, at least to the expert, but there are pitfalls the unwary may easily fall into, especially if one has not had sufficient practice in examining stools. Lamblia cysts, blastocystis, vegetable cells, and desquamated cells from the bowels are easily mistaken, and such mistakes are serious, as they may condemn a patient to a long course of emetine for no purpose whatsoever. Still more difficult, at least in the vegetable stages of the parasites, is the distinction between Entamœba coli, a harmless ameba, and the E. histolytica, the harmful one. In the tropics and abroad generally the former is very common, and there is no reason why mixed infections with both should not occur. This distinction between the two lies in the hands of the expert, but the broad rule generally adopted now is, if a patient is passing blood and mucus—that is, has signs of definite dysentery and has amebæ present—the case may be looked upon as an amebic one and treated accordingly. Later on, when the case becomes chronic or passes into the stage of the true carrier, cysts appear, and these can be differentiated from each other by their size, and the number of their nuclei.

Having then diagnosed the case properly—a most important thing—the next thing is to treat it, and this is done by emetine hydrochloride in varying doses and amounts. The drug may be administered in one of three ways: (1) Intravenously; (2) subcutaneously or intramuscularly; or (3) by the mouth.

As regards intravenous injections, Low has had no occasion to use them, but there is no reason why they should not be employed in fulminating or in moribund cases where time is precious. The most usual method of administering emetine is subcutaneously or intramuscularly. Subcutaneous injections often give rise to a considerable amount of pain and stiffness, and to avoid this some give them deep into the muscles similarly to quinine. There seems to be an idiosyncrasy in some individuals, a man Low treated having considerable trouble—pain and stiffness—after his injections, whether they were given subcutaneously or intramuscularly. These symptoms did not disappear for several days, and in two injections given in the loose cellular tissue of the abdominal wall slight hemorrhages occurred as well as a considerable amount of redness at the site of the injection. This happened, though every care was taken to sterilize the skin, syringe, and needles, and the ampoules came from the usual source. At the same time as this two other patients had similar injections, both subcutaneously and intramuscularly, without the least trouble. The stiffness and pain in the case just mentioned definitely prevented the patient having full use of his arms for several days, and this possibility must be borne in mind in giving injections to people who are up and about. As a rule now Low gives the injections intramuscularly, avoiding giving a second one near a place where one has been previously given, until all signs have disappeared. Even with large doses no sickness is produced by the injections.

As regards giving the drug by mouth, the method has the disadvantage that sickness may be produced. Provided the drug is retained, however, it acts quite as efficiently as by injections, and Low knows of one case in which it did better. When administered by this route one gives it in keratin-coated tablets at night when the patient has gone to bed, taking the same precautions as

one used to do with the old ipecacuanha treatment. He has tried this method fairly extensively, and finds that one of three things happens: (1) Either the patient has no sickness at all, (2) he may be sick for a night or two and then get quite accustomed to the drug, or (3) it may make him sick every time.

In acute cases in bed injections are best. In chronic cases with slight local lesions that one does not wish to keep in bed, or for some reason finds it inconvenient to inject, then the mouth method may be employed.

Another objection has been raised to the keratin-coated tablets, and that is that they may not dissolve and may be passed unchanged per rectum. This has not been Low's experience, but it is a possibility. If there is any suspicion of it, as evidenced by the case not improving as it should, the stools can be washed and the tablets searched for.

The salt usually employed is emetine hydrochloride. Recently Low tried another preparation for Dr. Balfour, made by Burroughs, Wellcome & Co., named methyl emetine. Though larger doses of this can be employed, it does not seem to be any more efficient than the hydrochloride, but one would need to try it on further cases before deciding finally.

The dose of emetine hydrochloride Low now usually employs is 1 grain for each injection, two of these being given a day, morning and night, for the first two or three days if the case is a bad one with much blood, mucus, and pain; or if not, only once a day. After that one-grain injections are administered every night until a total of 12 grains in all have been given. By this time all blood and mucus should have disappeared from the stool, and amebæ should no longer occur. Not uncommonly about the fifth or sixth day of treatment a moderate degree of looseness of the bowels, or in some instances a definite diarrheic condition, is met with. This may be due to the emetine itself, similar to what one got and aimed at in the old ipecacuanha treatment, and it does no harm. After the cessation of the drug the stools become solid, of a normal consistence, and no blood or mucus is seen on their surface. They should be carefully searched for amebæ, and if these return or if the mucus and blood appear again a second course of emetine will be required. This does not, as a rule, require to be so prolonged as the first, and may be given in 1-grain doses every night until 6 grains in all have been taken. Third courses are practically never necessary. In Low's experience larger doses than those mentioned are not required. If all symptoms of dysentery have not disappeared by the time the 12 grains are taken, then the diagnosis is in all probability at fault, and the condition is due to some other cause than the entameba. With such doses toxic symptoms do not occur, but it is quite possible that if the drug is given in larger individual doses and kept up over long periods of time such might appear. As has been pointed out, there is no necessity for this, excessive doses not being required. The action of the drug on the vegetative or living stage of the amebæ is very rapid, the parasites quickly disappearing, as do also the blood and mucus, and other symptoms.

In addition to the emetine treatment, acute cases of dysentery are, of course, kept strictly in bed and on a strict diet. At first only milk or liquid diet in the shape of whey and weak soup is allowed; then, as the symptoms subside, milk puddings may be substituted, these in turn being followed by a further increase until pounded white fish and chicken are reached. No alcohol is permitted at any time. After treatment, during convalescence, and for at least four to six months afterwards, the patient must be kept on a simple white-meat diet with plenty of milk, no beef, coarse vegetables, curries, spices, alcohol, or things of that sort being allowed. In addition to diet, chills and wetting must be carefully guarded against. Relapses of amebic dysentery, even after very careful treatment, are frequent, and it is only by taking the greatest precautions and care that these may be avoided.

Often chronic cases of amebic dysentery present themselves for treatment. The symptoms depend upon the amount of bowel involved and the character of the lesions present. Blood and mucus to a certain extent are generally present in the stools, or all that may be found is some looseness of the bowels, with two or three actions a day, or slight diarrhea. In this latter type of case the only reason for suspecting dysentery is the presence of the specific parasite, often now in the cystic or resting stage. These cases act as true carriers and are dangerous to other people, the cysts being the infective agent that passes the disease on from one person to another. Such cases may require to be isolated. It has been stated that emetine has no effect upon the cysts and does not cause them to disappear. In a case Dr. Wenyon and the writer recently studied carefully this was not so. Injections of emetine in 1-grain doses daily quickly caused them to vanish, and they have not reappeared again up to date (some months later). The treatment of these chronic cases and carriers is the same as for the acute ones. It may not be necessary to confine them so strictly to bed or even to keep them in bed at all, but they should be put through a similar course of emetine and be dieted in exactly the same way. In addition to amebic manifestations of the bowel, the liver may be involved and an abscess may threaten to form. Here, again, emetine works in a most miraculous manner, and if applied in the doses mentioned above may completely abort all the symptoms. Since its introduction the chances of averting suppuration have increased enormously, and fewer cases of abscess of the liver now come to the operating table.

Though practically all cases of amebic dysentery respond quickly to emetine treatment, there is a small residuum—in which there has been no doubt of the correctness of the diagnosis—which does not, symptoms continuing, and amebæ, vegetative or cystic, being still found in the stools. Such cases require further careful study to explain this anomaly.

In all the stages of the treatment of the disease it is of fundamental importance that the stools should be carefully looked at every day. There is no other way really of being certain how the drug is acting unless this is done. Where obtainable, flat glass stool dishes will be found very useful. One can examine the feces then without removing the glass top and so avoid the horrible smell so many of these stools have. In addition to these macroscopic examinations, careful microscopic ones must also be carried out at least every second or third day.

TREATMENT WITH MIXED VACCINES.

In the *New York Medical Journal* of December 18, 1915, THIBAUDEAU writes upon this subject and concludes that:

1. The intravenous administration of phylacogen is followed by a prompt (about four hours) and marked leucocytosis, which is seen by making leucocyte determinations at two-hour intervals.

2. A considerable increase in the proportion of polymorphonuclear leucocytes is also noted by the same means; therefore, the actual number of the leucocytes (phagocytes) is markedly increased.

3. The intravenous administration of mixed vaccines in these cases promptly increased the opsonic index to the infecting microörganisms isolated from the patient, even when they were of two or more species.

4. These phenomena are usually (not always) synchronous with certain characteristic changes (rises) in the pulse, temperature, and blood-pressure, which are followed by a fall to normal or even subnormal.

5. Coincidental with the phenomena noted above was marked improvement in the clinical condition for which treatment had been instituted.

6. Mixed vaccines, in Thibaudeau's opinion, represent multiple antigens, their therapeutic efficiency being due to their ability to stimulate the formation of antibodies.

7. Their action resembles in a general way that of bacterial vaccines. The action, however, is more prompt (1, 2, and 3

above), owing probably to the elimination of the delay incident to the splitting of the bacterial cell, the metabolic products (bacterial derivatives) concerned in their action being immediately available. At the same time their action is probably not so permanent as that of the vaccines, because of their more rapid absorption.

A CHEMICAL AID IN SECURING THE SPIROCHETA PALLIDA FROM SYPHILITIC LESIONS.

LLOYD, in the *Boston Medical and Surgical Journal* of December 16, 1915, states that some four months ago in a short monograph he came across the statement that alcohol applied to any ulcerated specific lesion, either primary or secondary, increased greatly the number of recoveries of the spirocheta pallida. Since that time his method in the South Medical Department at the Massachusetts General Hospital has been the following:

First carefully clean the lesion, using water or salt solution, and then wash it with 95-per-cent alcohol. This is only slightly painful. Then by lateral pressure Lloyd almost always secured a most abundant supply of serum, presumably serum from the deeper layers; for since he has been applying alcohol to the primary lesion or the ulcerated secondary lesion his percentage of recoveries of the spirocheta pallida has averaged at least 95. It is impossible to say what the recoveries were before the use of alcohol, but he estimates them to be at least 20 or 25 per cent less.

RADIUM IN DERMATOLOGY.

In the *Journal-Lancet* of December 15, 1915, SWEITZER reports his clinical experience and concludes that:

1. Radium has a definite value in the treatment of certain skin conditions.

2. It is easily controlled, and is of accurate dosage.

3. Its application is unattended by pain, and is very pleasing to the patients, especially the young and the very old.

4. The cosmetic results are excellent.

THE PREVENTION AND TREATMENT OF RINGWORM AND FAVUS OF THE SCALP.

LANE in the *Journal of the American Medical Association* of November 13, 1915, reaches these conclusions:

1. The hair should be cut over the whole head, but it should not be shaved, as this would prevent effectual depilation. This is essential in all cases of favus and in all cases of ringworm, except those of very limited extent. In these the hair must be cut well around the edges of the affected area. The purpose of this cleanliness is prevention of the spread of the disease, easier discovery of new patches, and facilitation of the treatment.

2. When crusts are present they must be removed. This is best accomplished by soaking the head with oil for a day or two to soften them. Cottonseed oil, to which one per cent of betanaphthol has been added, serves the purpose admirably. The head is then washed with an antiseptic soap, for which the following formula may be used:

℞ Betanaphtholis, 3 parts;
Sulphuris præcipitati, 10 parts;
Saponis mollis, q. s. ad 100 parts.

3. Depilation is the most important as well as the most difficult and tedious part of the treatment, except when the Roentgen ray is used. The most satisfactory method of depilation is still that of the thumb forceps, although many easier and quicker methods have been tried. In extensive cases of favus, the whole head must be depilated and redepilated as fast as any hair grows, for at least three months. In early cases with small areas involved the depilation may be limited to the affected areas and a circumference of half an inch. In the case of ringworm, depilation of the patches cannot be completely accomplished, as many of the hairs are broken off and the rest are so fragile that they break when this is attempted. But all patches should be kept as completely depilated as possible, together with the surrounding area, as in the case of favus.

4. The value of antiseptic applications

lies in the destruction of the superficial fungi and in preventing the spread to other spots and to other individuals. They also serve the additional purpose, in the case of ringworm, of irritating and causing some inflammation in the affected areas, which facilitates the expulsion of the stumps of the broken hairs that cannot be pulled out. The affected areas are painted daily with:

℞ Tincturæ iodi, 20 parts;
Alcoholis, 80 parts;

and the following ointment applied to the whole head:

℞ Hydrargyri præcipitati, 1 part;
Sulphuris præcipitati, 1 part;
Resorcinol, 1 part;
Olei cadini, 10 parts;
Petrolati, 10 parts;
Adipis lanæ, 10 parts.

5. The head should be washed daily or every other day with the antiseptic soap for which the formula has been given. If crusts persist in forming they are softened and removed as often as necessary.

6. The following additional precautions should be taken: It is hardly necessary to say that individual toilet articles should be used. Keeping the hair cut short removes any necessity for the use of comb and brush. Affected children should sleep alone. Other children should not be allowed to wear the hats of the patients. The heads should be isolated as well as possible, and for this purpose there is nothing better than a tight-fitting cotton cap which can be boiled or thrown away when soiled. The scalps of persons affected with these diseases bear irritation remarkably well, and there is usually no occasion for interrupting the treatment. However, if the heads become sore from it, it is stopped for a few days, and petrolatum applied till it is resumed.

If these steps are carried out faithfully for a long enough period of time, the diseases will be cured and their spread pretty well limited. In extensive cases, the time necessary for cure is not likely to be less than two years, except in some of the rarer varieties of ringworm. When a case after vigorous treatment is apparently cured, treatment should be suspended for a month or six weeks. If there are no signs of recurrence at the end of that time, the patient should be examined occasionally for another six weeks before he is pronounced cured. If, in the meantime, any unhealed spots become visible, treatment should be at once resumed.

This is not an easy way to cure these diseases, but the more thoroughly it is realized that, with the exception of the Roentgen ray, there is no easy way of curing them, the better shall we take the precautions necessary for preventing their becoming so numerous as to present a serious problem.

The applications mentioned are no better and no more efficient than many others. They may be varied *ad libitum* with perfect confidence that many others are just as efficient in keeping the surface clean, and just as efficient for affecting the disease in the hair follicles.

The difficulties encountered in the treatment of ringworm have been well stated by Martin as follows:

1. The multiplicity of treatments proposed.
2. The confusion in the diagnosis of the different varieties.
3. The certainty of an ultimate spontaneous cure.
4. The depth of the anatomic seat of the lesion.
5. The difficulty of diagnosis, especially of an early diagnosis.
6. The difficulty of diagnosis of cure.
7. The difficulties of prophylaxis.

All of these difficulties are considerable in the case of ringworm, and for the most part equally so in the case of favus.

THE ALLEN TREATMENT IN DIABETES MELLITUS.

Writing in the *New York Medical Journal* of December 18, 1915, BOOKMAN asks, What are the practical results of this treatment? Do patients treated in this way live longer? The method is too recent for positive proof to be given on this point. Bookman's own conviction is that for severe

diabetics it is a great advance on previous methods of treatment. This is based on the results published by Allen and by Joslin and on his own experience, particularly with juvenile patients, of whom he has treated eight. Seven of them, at the time treatment was begun, were between fourteen and twenty-three years of age, the other patient being twenty-nine years old. All had been previously treated by various methods, and in none had glycosuria disappeared for more than a short time. Most of them had a marked acetone reaction and several had a decided ferric chloride reaction. On ordinary starch-free diet not quantitatively controlled they all excreted sugar. On the Allen treatment, glycosuria rapidly disappeared and remained absent for months, except for that caused by experimental additions to the diet. The ferric chloride reaction did not reappear as long as the patients were kept under observation. Two of them have a trifling acetonuria, and others have none. The amount of urine has diminished decidedly in all, though several still pass from two to three liters a day. Such complications as eczema, pruritus, furunculosis, and xanthoma disappear rapidly. All but one of these cases has been under observation for at least four months, most of them more than twice this time. In all there was a preliminary loss of weight. They have regained this and have even added to their original weight. They all feel stronger than before beginning treatment. Five of them are working.

The older patients have not been followed up to the same extent, but those still under observation are sugar-free and appear well with one exception. This is a woman of sixty years with by far the mildest diabetes of Bookman's series. After a short preliminary period she was put on a liberal diet containing 250 grammes of bread and over a pound of meat daily, with fat in such amount as she would take. She manifested pulmonary tuberculosis three months after beginning treatment, probably from a preëxisting focus.

For what cases should the Allen treatment be used? Bookman has had no cases of impending coma and cannot, therefore, speak of its effect in this condition. He would scarcely expect, however, anything beyond temporary improvement in the vast majority of cases which have reached this stage. With any method of treatment we shall continue to have deaths in coma. It is likely that the best means of combating this complication in its early stages will not be the same in every case. Both Doctor Allen and Doctor Joslin have reported deaths in coma. Most of these occurred in patients in whom treatment was not undertaken until premonitory symptoms of coma had appeared, or in patients who, when no longer under observation, had broken the dietetic rules. On the other hand, Allen has had patients with impending coma come in whom the treatment was satisfactorily carried out.

The treatment may therefore be used in all cases. In older persons who are passing small amounts of sugar and have little or no acidosis, less drastic measures will usually be preferred. In such patients the glycosuria will frequently disappear if sugar is abstained from or if, in addition, the starches are moderately restricted. In all other cases the treatment is advisable. It is especially indicated in all youthful diabetics, in all patients who are passing large amounts of acetone bodies, and in all those whom for any reason it is especially desired to make aglycosuric as quickly as possible.

It may be thought that special facilities are necessary for carrying out the treatment. In severe cases it is certainly desirable at the beginning to have patients under close observation, but successful treatment is perfectly feasible under the ordinary conditions of private practice. In the way of laboratory examinations only the usual tests for acetone, diacetic acid, and glucose are indispensable. The food can be weighed and prepared as well in the home as in the hospital. The patient must become familiar with the details of the treatment, and this knowledge can best be gained if the treatment is given at home. In six of Bookman's cases, treatment was insti-

tuted and followed up exclusively at the Mount Sinai Dispensary; this number includes one of his first cases, an Italian woman of twenty-nine years. During the entire treatment she has continued to look after her household of seven young children. Before treatment she had a sugar excretion of 400 grammes daily and a strong reaction for diacetic acid; she has now been sugar-free for several months without acetonuria and has gained thirty pounds in weight.

To sum up, then, Bookman's results agree with those obtained by Doctor Allen and by others who have worked with the method. The patients have rapidly become sugar-free and with few exceptions have improved in every way. The results in the juvenile cases are most convincing. In the management of severe diabetes, this method is a great step in advance. As a routine measure in all diabetics it brings excellent results and brings them quickly.

[For details as to the Allen method see the THERAPEUTIC GAZETTE, January, 1916.]

THE BACTERIN TREATMENT OF CERTAIN CHRONIC PYOGENIC DERMATOSES.

In the *Boston Medical and Surgical Journal* of December 16, 1915, DENNIE publishes tables of results and states that an examination of the tables gives, in a concise form, the following facts:

Sixty-four per cent of all cases treated by bacterins were apparently cured, twenty per cent were benefited, and sixteen per cent received no benefit whatever.

Autogenous bacterins were superior to stock, excepting in the treatment of furunculosis, where no difference could be seen.

In most cases a permanent cure resulted from the use of bacterins. This contention is supported by the fact that there were only two recurrences in those who reported at the end of one year.

In acne the best results were obtained in the indurated type. The comedo type responded less favorably.

Of the three pyogenic dermatoses, the best results were secured in furunculosis.

The action of bacterins in the treatment of sycosis was very erratic; in one case of twenty years' duration in which external treatment had been faithfully used for five years and in which stock bacterins had been administered, autogenous bacterins were used with remarkable success. On the other hand, two cases were very much aggravated by this form of treatment.

MANAGEMENT OF TOXIC GOITRE.

In the *Philadelphia Weekly Roster* of December 18, 1915, FRAZIER states his views as follows:

Toxic goitre may be either that which begins as simple goitre and becomes transformed into the toxic variety or the true exophthalmic goitre. The principal distinction to be made surgically is in reference to the severity of the case. The treatment of this condition belongs essentially to the domain of surgery. If the circumstances of a person suffering with moderate thyrotoxicosis are such as to render impracticable a prolonged period of rest, the writer strongly urges immediate operation and proceeds to the removal of as much of the offending gland as conditions indicate.

The mortality is insignificant; personally he has not lost one case of this type. In a grave form of intoxication the watchword is caution. It is out of the question to say what the order of procedure should be until after the patient has been under observation in bed for a few days, during which a study of the body functions and all the available secretions and fluids has been made. Each case presents its own problem as to whether it should be treated by boiling-water injections, ligation of one or more vessels at one or more sittings, or by partial thyroidectomy. A good working rule when in doubt is to err on the side of conservatism. A patient should not be operated upon in the stage of acute exacerbation. Rest is the most fruitful nonoperative measure. The writer has tried the *x*-rays and radium without appreciable effect.

In all operative cases anociassociation is employed routinely and successfully. Nitrous oxide anesthesia is always used. The relation of the thyroid to other ductless glands, especially the thymus, should not be overlooked. In 76 thyroidectomies for toxic goitre the writer has had no deaths, and in 24 ligations two deaths. He would not at this time consider such cases as the two fatal ones suitable for that particular operation at that cycle of the disease.

HEMORRHAGIC DISEASE OF THE NEW-BORN.

TALLANT says in the *Woman's Medical Journal* for December, 1915, that hemorrhagic disease of the new-born is still so baffling a condition that there may be value in reporting even a single case, such as the following:

Philip K. was born February 8, 1915, at the Maternity of the Woman's Medical College of Pennsylvania. The family history was good, and the mother, a primipara of twenty-three years, had a normal labor, with a second stage of only thirty minutes. The baby, although considerably cyanosed at birth, responded quickly to the usual slaps across the buttocks; he was particularly strong and hearty, weighing 8¾ pounds.

On the morning of the third day of his life an area of hemorrhage began to develop under the skin of the neck and upper chest, extending up under the left ear. This area was indurated and somewhat swollen. The baby was at once put on drop doses of adrenalin, and saturated solution of gelatin in drachm doses, with whisky as stimulation. The temperature was 100°, pulse 132, and respiration 34, but these rose rapidly through the day to 103.6°, 168, and 52, respectively. By evening the swollen area, while apparently receding slightly on the chest, had risen almost to the chin, and extended under the right ear as well as the left. A small hemorrhagic spot was found on the roof of the mouth, and a bowel movement showed a few streaks of red blood. By the next morning, although the area of the hemorrhage had spread no farther, the swelling had increased and was now so tense that the child lay with the head thrown far back, the occiput almost touching the back. Nursing was impossible, and even swallowing was very difficult. The baby was cyanosed and dyspneic from the pressure, and the muscles of its legs and arms were rigid. Three petechial spots were found on the back, and one on the left ankle, and there was slight oozing from the umbilical cord.

At the request of the hospital resident about two-thirds of an ampoule of coagulose was injected hypodermically at half-past two that afternoon. The child's condition showed little change, but no new areas of hemorrhage appeared. On the following morning, the third day of the disease, the temperature stood at 102.8°, and the baby showed no improvement, but no further extension of the trouble. The remainder of the contents of the ampoule was then given.

From that time on the symptoms began to abate. By midnight the temperature had come down to 100° and did not again go above that point; the petechial spots began to fade; the swelling under the chin slowly softened and became absorbed.

On February 17 (the ninth day of the baby's life, and the sixth since the onset of the disease), nursing was resumed and the baby began to gain; its weight had dropped to 7 pounds 6 ounces during its illness. On this same day a fresh hemorrhagic spot, the last one, was noticed on the sternum, and a rash came out over the body. The cord had separated the day before without any bleeding.

On the twelfth day of her puerperium the mother insisted on going home. The baby was now in fair condition; it was nursing well, and had gained three ounces; the rash had practically disappeared.

When the child was about seven weeks old the mother brought him to the hospital at our request. He was then as hearty and vigorous a baby as one could wish, and weighed nearly thirteen pounds. No trace of the hemorrhagic areas could be found.

SOME OBSERVATIONS ON THE TREATMENT OF DYSMENORRHEA.

In the *American Journal of Obstetrics* for December, 1915, BLOCK points out that atropine diminishes the irritability of the autonomic nerves, and after its administration there is a relaxation of the uterine musculature and a consequent disappearance of uterine colic. Stolper divides his dysmenorrhea patients into two groups: (1) those with normal or nearly normal blood-pressure, and (2) those with increased pressure. He states that the patients in the first group are usually benefited by atropine, while those in the second group are not at all helped by it. In this second group, after the pelvic circulation is properly regulated, the blood-pressure falls.

The atropine treatment has been tried with favorable results by Novak in Europe as well as by Novak in this country, who in a recent article says: "The results in thirty or more cases of spasmodic dysmenorrhea which I have treated with atropine have been very encouraging, so much so as to impel me to the further employment of the method." Block's own results in a limited number of cases have also been most satisfactory. The method of administration which he employs is to direct the patient to take 1/100 grain of atropine sulphate two or three times a day for two days before the expected period and continue it after the flow appears until relieved of symptoms. In addition to this or any other form of treatment, the proper attention must be paid to the lower intestinal tract and general personal hygiene, and he is heartily in accord with Mosher regarding general hygiene and exercises, although he has not the high degree of enthusiasm that he has over the results obtained from exercises *per se*, possibly due to his lack of experience with the method of treatment.

TABULAR CLASSIFICATION.

TYPE.	SYMPTOMS.	CAUSE.	TREATMENT.
Obstructive.....	Premenstrual uterine colic. Scant flow for one or two days. Pain disappears as flow becomes profuse.	Obstruction to lower uterine segment or vagina.	Removal of obstruction.
Ovarian.....	Bilateral ovarian pain synchronous in onset with the appearance of the flow; premenstrual headache and nausea. Uterine cramps after flow is established.	Increased ovarian secretion.	1. Intranasal treatment. 2. Hypodermic injections of adrenalin.
Vagotonic.....	Severe lower abdominal cramps and other symptoms suggestive of the obstructive type.	Increased irritability of the autonomic nervous system.	Large doses of atropine for a day or two before the expected period.

Block's object in presenting this paper is to make a plea for the careful differentiation of the various types of dysmenorrhea, and, having accomplished this, to give the patient the benefit of that method of treatment which has been shown to be of avail in the particular type from which she is suffering, and by so doing we may look for relief of symptoms in the large majority of cases. Let us hope that the promiscuous dilatation and curettage and the antidysmenorrhea proprietaries may soon be past history.

THE PROPER POSITION OF TONSILLECTOMY IN PEDIATRICS.

In the *Archives of Pediatrics* for November, 1915, BLUM makes these sane conclusions:

Tonsillectomy is an excellent surgical procedure in certain cases.

It should be the operation of choice in malignant disease of the tonsils.

It may be indicated in recurrent peritonsillar abscess.

It should not be performed in infants.

It should only in exceptional cases be performed before the eighth year; between the eighth and fourteenth years if possible

evidence of a serious local or systemic injury emanating from diseased tonsils can be adduced, and if the tonsillar affection does not yield to conservative treatment enucleation is indicated.

THE TREATMENT OF INFANTILE BERIBERI.

In the *China Medical Journal* for November, 1915, ALBERT reminds us that following the theory of "avitaminosis" and drawing their conclusions from the prophylactic and curative actions of the extract of tiqui-tiqui on "polyneuritis gallinarum," Chamberlain and Vedder, of the United States army board for the study of tropical diseases, in February, 1912, recommended the use of the extract in the treatment of infantile beriberi without the discontinuance of the maternal feeding, thus avoiding the dangers of artificial feeding. The method of preparation of this extract is fully described in this paper. Five cubic centimeters of the extract thus prepared represent about 82 grammes of rice polishings. The dose prescribed by them was 5 cubic centimeters of the extract a day, given in 20-drop doses every two hours while the child is awake.

Albert has had the opportunity of using this extract in a great many cases of infantile beriberi, from the year 1912 to the present date, and he believes that this medicine is of immense value in the treatment of the disease in question and that it is excelled by no other drug known at the present time. His distinguished colleagues of Manila, Doctors Calderon, Quintos, Luis and Manuel Guerrero, Valdes, Gabriel, and others, are of the same opinion.

Because of these astonishing results, both the committee for the investigation of infant mortality and the Segunda Asamblea Regional de Medicos y Farmaceuticos have requested the Philippine Legislature to adopt measures so that this extract may be distributed freely to the poorer class. As a result of this request the Philippine Legislature in February, 1914, passed Bill No. 2376 providing the sum of 6000 pesos for the preparation and free distribution of the extract of tiqui-tiqui. The bill also provides that the Liga Nacional Filipina para la Proteccion de la Infancia will superintend the preparation and experimentation, will look after the free distribution of the extract among the poorer class, and will present a written report of the results of their experiments, through the Secretary of Public Instruction, at the beginning of each regular session.

Although the time that has elapsed since the first experiments were made is not long enough to permit Albert to draw definite conclusions, his opinion with regard to this extract is very favorable. The administration of the extract when given in time and in convenient doses is followed at once by marked improvement. At the end of twenty-four hours the vomiting, whining, restlessness, insomnia, dysphagia, polypnea, and oliguria all disappear as if by magic. To the great surprise of the young physician the clinical syndromes change in aspect in a very short time, and at the end of three days one can say that the disease has disappeared, at least externally, leaving the aphonia, which in its turn disappears by the end of the seventh or eighth week. (Albert has attended a case in which the aphonia lasted for about eight months.) If no improvement follows after twenty-four hours, or if the case under treatment is of great severity, Albert obtains the desired effect by doubling the dose. It is better to give larger than smaller doses. The extract is inoffensive and entirely uninjurious, save for a slight diarrhea which follows its administration. With the method of giving large doses to acute cases they have in practice saved from sure death many cases of beriberi of the pernicious larval type, which formerly were believed to be hopeless and incurable.

The administration of the extract must be continued as long as the aphonia persists. So long as the voice has not recovered its normal pitch, the infant is constantly threatened by an acute attack which may terminate in death in a few hours. In cases of infantile beriberi without aphonia, it is

wise to prolong the treatment at least three weeks after apparent cure, to avoid relapses which frequently occur. It is necessary to impress upon the mother the importance of prolonging the treatment, as it is the tendency, in private practice, to discontinue treatment as soon as the acute symptoms disappear.

The failure of the extract to effect a cure may be due to many causes:

1. Extreme severity of the case—a very advanced neuritis. Vedder and Clark, in their work on polyneuritis gallinarum, have shown that symptoms appear only when the anatomic lesions in the nerves are well advanced. It is the same with infantile beriberi. It is not infrequent that mothers bring their children when the disease is far advanced. Therefore it is necessary to give the extract early in the disease in order that the treatment be successful.

2. The extract proves ineffective also in cases associated with other infections, commonly pneumococcic in the form of bronchopneumonia, which is a frequent complication of infantile beriberi.

3. Another cause of failure of the extract is its poor quality. It has either an insufficient quantity of the active principle or an excess of alcohol which makes its ingestion disagreeable and injurious. Analyses made by the Bureau of Science of the extract prepared by the local drug stores revealed the fact that all the samples with the exception of one from one drug store were very deficient in the active principle. This was why treatment with extracts of tiqui-tiqui obtained from this drug store were the most successful.

The interpretation of the curative action of the extract of tiqui-tiqui is not a hard task. Hirota's theory of intoxication can be discarded. It does not explain why the beriberic child treated with tiqui-tiqui extract improves and gets well even without discontinuing the maternal nursing. The extract has no antitoxic properties and, therefore, it cannot be said that it neutralizes the toxic action of the breast milk.

Knowing the prophylactic and curative actions of the extract in polyneuritis gallinarum, which is caused by a deficiency in the diet, we must admit that this extract supplies the beriberic infant with nutritive elements, probably the vitamines, in which the beriberic milk is found deficient.

According to Funk these vitamines play an important rôle in the metabolism, as do the hormones, ferments, and internal secretions.

Bearing in mind that infantile beriberi under a clinical aspect is principally a vagotonia—an abnormal irritability of the vagus—it is logical to believe that the curative action of the extract is due to the fact that it supplies the vagus with the necessary vitamines for the normal performance of its functions. Using the words of Eppinger and Hess, we can say that the extract of tiqui-tiqui is a vegotropic drug, like pilocarpine, which has a selective and specific action on the vagus nerve.

But supplying the vagus with its much-needed vitamines, its abnormal irritability, manifested by vomiting, by angina pectoris (whining and restlessness), and by polypnea because of its bronchial and pulmonary terminations, entirely disappears.

The failure of the extract to cure the aphonia can be attributed to a very advanced degenerative neuritis of the recurrent branches of the vagus nerve, which are the first to be affected in all cases of dietetic deficiency, as evidenced by the clinical fact that the aphonic form constitutes from 80 to 90 per cent of all cases of infantile beriberi.

TREATMENT OF VAGINAL DISCHARGE.

In the *New York State Journal of Medicine* for December, 1915, CHANDLER says that the treatment for this condition, outside of general tonic treatment, usually consists in giving the patient some kind of a douche containing carbolic acid, bichloride of mercury, lysol, etc., or a series of tampon treatments with boroglyceride, ichthyol, or the like. As chief of the out-patient gynecological department of one of the large New York hospitals some years ago, and in similar work elsewhere, Chandler has had

considerable opportunity to try these various treatments, and in his own hands has found them, in the majority of cases, very unsatisfactory.

In consulting the later text-books he finds nothing new on the subject, but only the stereotyped treatment which has been in use for years and to which every author attributes but indifferent results. Except in the case of acute gonorrhea, he therefore adopted a dry method of treating these discharges, and had such satisfactory results that he has made it a routine procedure.

With the patient in the dorsal position on table or chair, with good light, a narrow, long bivalve speculum is inserted and the vagina and cervix carefully wiped with cotton. If adenomatous disease of the cervix and granulations or retention cysts are present (and they usually are), Chandler curettes the granulations, incises the cysts, and then treats the cervix as follows:

Pure carbolic acid on cotton about a probe is inserted in the cervical canal through its entire length, being careful not to enter the uterine cavity, however.

The vagina is then painted in its entirety with a ½-per-cent solution of tincture of iodine. The entire surface can be reached by turning the speculum about and painting the folds as they protrude between the blades. Immediately enough plain sterile gauze is packed all about the cervix and in the vagina to fill it comfortably, and far enough above the urethra to avoid soiling by the urine.

If the mucous membrane looks healthful, he repeats this iodine and carbolic acid treatment three or four times, at intervals of forty-eight hours. After that he dusts the vaginal surfaces with a powder composed of equal parts of boracic acid and stearate of zinc and then packs with dry sterile gauze. This procedure is repeated three or four times at forty-eight-hour intervals like the other.

The gauze should never be left longer than forty-eight hours on account of fermentation and the attendant irritation to the mucous membrane, which would defeat the object of the treatment.

It sometimes happens, where the mucous membrane is particularly sensitive, that on removal of the gauze after the first forty-eight hours a number of slight excoriations will be found on the vaginal surface. In such cases, instead of going on with the iodine treatment, Chandler uses the zinc and boracic acid treatment the second time. In other words, he alternates the two treatments, always finishing with the zinc and boracic acid.

The patient is then told to come after her next menstrual period and report. This treatment should always be begun a few days after menstruation, so that there will be time for its completion between periods.

In the majority of cases they return with the cheering news that the leucorrhea has disappeared. Sometimes a couple of months later he has had a patient return, saying that the discharge was reappearing. One treatment of carbolic acid and iodine, followed in forty-eight hours by the zinc and boracic acid as described, will usually be enough to complete the cure.

Clinically, Chandler believes that as a cleansing media water should be used as a douche, but no medication other than salt or bicarbonate soda should be allowed in it. Carbolic acid does not dissolve well and a rather concentrated solution will usually be the last to leave the douche-bag, tending to aggravate the trouble.

During the last year he has treated a large number of such cases with surprisingly good results, and the fact that women are constantly presenting themselves at his office, saying they have been sent by those already benefited, leads him to believe that the treatment is worth presenting for consideration.

This treatment is also efficacious in gonorrhea of long standing. In acute vaginitis due to the presence of the gonococcus, the patient is put to bed and the vagina is packed lightly with sterile gauze in which the dry boracic acid powder has been incorporated. A urinary antiseptic, such as urotropin, is administered, light diet prescribed with plenty of fluids by mouth, the gauze is removed each day, and after

the acute stages have subsided the dry iodine treatment as before advocated is followed out.

In all chronic vaginal discharges local treatment must, of course, be supplemented with supportive treatment. Constipation must be corrected by the establishment of habit and the use of mild laxatives. This is very important.

Where there is anemia, small doses of iron long continued are more efficacious than the large doses we used to give.

The right kind of food, exercise, and later a change of climate are enjoined.

In gonorrheal vaginitis of children the foregoing is not indicated. Local treatment is of no avail in these cases, and the trouble is most successfully combated by the use of vaccines.

In conclusion Chandler says that he is firmly convinced that douches and the usual moist tampons do not cure leucorrhea. While they have a tendency to alleviate for the time being, they certainly irritate and eventually provoke the very conditions we are trying to cure.

Why is it not rational to treat the vagina along the same advancing lines followed in modern surgery as shown in the care of wounds? The use of water is now practically eliminated from all inflamed surfaces. Wounds and cavities are kept dry and clean with possibly the use of a mild antiseptic. Following out this same line of treatment for vaginal discharge is only keeping pace with the advancement of surgery toward a scientific simplicity and a more perfect asepsis.

COMBINED VACCINATIONS.

In the *Indian Medical Gazette* for November, 1915, CASTELLANI concludes that:

1. The preparation of combined vaccines is based on the experimental work he carried out in 1901-1902 in Professor Kruse's Institute, when he demonstrated that, inoculating an animal with three species of bacteria, provided a sufficient minimum quantity was given, agglutinins and immune bodies for all three species were elaborated, the amount of agglutinins and immune bodies elaborated for each being nearly the same as in animals respectively inoculated with one species only.

2. In the lower animals he has used (rabbits) no good results are obtained as a rule by inoculating more than three species of bacteria. In man it appears that four species can be inoculated with satisfactory results, and occasionally even more.

3. He has prepared and used in man the following vaccines:

(1) Typhoid+paratyphoid A+paratyphoid B.
(2) Typhoid+Malta fever.
(3) Typhoid+paratyphoid A+paratyphoid B+Malta fever.
(4) Typhoid+paratyphoid A+paratyphoid B+b. Asiaticus+b. Columbenis.
(5) Typhoid+paratyphoid A+paratyphoid B+b. Asiaticus+b. Columbenis+Malta fever.
(6) Typhoid+paratyphoid A+paratyphoid B+dysentery Kruse-Shiga+dysentery Flexner+dysentery Hys. Y.+dysentery Flexner-like No. 1+dysentery Flexner-like No. 2.
(7) Cholera+plague.
(8) Cholera+typhoid+paratyphoid A+paratyphoid B.
(9) Cholera+typhoid+paratyphoid A+paratyphoid B+Malta fever.
(10) Cholera+plague + typhoid + paratyphoid A+paratyphoid B.
(11) Cholera+plague + typhoid + paratyphoid A+paratyphoid B+Malta fever.

4. The inoculation in man of the above combined vaccines is harmless. The reaction is not very severe, with the exception of those containing plague, such as "cholera +plague" and "cholera+plague+typhoid paratyphoid A+paratyphoid B" vaccines. These give a more severe reaction than Lustig's simple plague vaccine, but apparently less than Haffkine's simple plague vaccine.

5. The combined vaccines Castellani is now using consist of carbolized emulsions of agar cultures in normal salt solution without heating. These emulsions seem to give a less painful local reaction than broth cultures killed by heat. The presence of 0.5-per-cent carbolic acid is sufficient to kill the germs. The "typhoid+paratyphoid A +paratyphoid B" vaccine is, however, also prepared by heating broth cultures at 53° C.

6. The individuals inoculated with the

above mentioned vaccines, consisting of 2, 3, and 4 species of bacteria, generally produce agglutinins for each species of bacteria inoculated, and the amount is not much less than in control individuals inoculated with simple "one-disease" vaccines. As regards vaccines consisting of more than four species, some seem to induce production of a fair amount of agglutinins for all the species, others do not give such satisfactory results, agglutinins developing only for certain species and not for all.

7. The combined vaccines which Castellani has found most useful from a practical point of view are the "typhoid+paratyphoid A+paratyphoid B" prepared and used by him since 1905: the "cholera+plague vaccine," the "typhoid+paratyphoid A + paratyphoid B + Malta fever," the "typhoid+paratyphoid A+paratyphoid B+cholera."

8. The use of efficient mixed vaccines is of practical advantage, as it is in this way possible to give a certain degree of contemporaneous immunity for several different maladies. This procedure saves a great deal of time and trouble. Moreover, in his experience very few people will submit themselves to the discomfort of repeated injections, which would extend over a period of several weeks, in order to be inoculated against three or four different diseases.

THE NITROGEN BALANCE IN DIABETES MELLITUS AND ITS IMPORTANCE IN TREATMENT.

In the *Lancet* of November 27, 1915, CAMMIDGE states it has long been recognized that the essential feature of diabetes mellitus is a failure of carbohydrate metabolism, with the consequent presence of sugar in the urine. As the metabolic changes have been more thoroughly and completely investigated it has been increasingly apparent, however, that a simple defect in the utilization of carbohydrates is comparatively rare and that there is usually more or less interference with the utilization of fats and proteins as well. These defects are relatively slight in some instances, while in others they are prominent and constitute the most serious feature of the case; but it is obvious that if the maximum benefit is to be derived from the dietetic treatment of the condition all deviations from the normal must be taken into account, otherwise a diet may be prescribed which in the end will do more harm than good. The failure of a "carbohydrate-free" diet to control the disease, or even to check the glycosuria in some cases, is thus frequently accounted for, since it attempts to deal with only one feature of the case, the defective utilization of carbohydrates, and neglects other possible deficiencies in metabolism.

With the discovery of the acetone bodies, and the realization of their significance as a sign of faulty fat metabolism, an important advance was made on Rollo's plan of excluding carbohydrates as much as possible from the diet in all cases of glycosuria, and it is now common knowledge that the persistent presence of acetone bodies in the urine is an indication that an ordinary "strict diet" cannot be tolerated. The occurrence of defects in the utilization of proteins and the results of increasing the protein content of the diet beyond the patient's powers of dealing with them efficiently are, unfortunately, not so well known, although they are equally important. One reason for this neglect undoubtedly is that the products of imperfect protein metabolism cannot be recognized in the urine by an easily applied color-test like sugar, acetone, or aceto-acetic acid, but are only to be detected by making a series of quantitative analyses of the collected and measured twenty-four hours' excretion when the patient is on a diet of known composition. As a similar series is needed for the accurate determination of the carbohydrate tolerance of the case, it only entails a little extra work on the part of the observer.

In a healthy individual the total urinary nitrogen is practically equal to the amount ingested, barring the small extra-renal excretion in the feces, perspiration, hair, and nails, which averages about 1 gramme daily. The level of nitrogenous equilibrium

varies with the character of the diet, although there is always a tendency to establish a correspondence between the intake and the output in spite of wide variations in the nature of the food. A similar tendency is seen in diabetics, but their powers of adaptation are diminished, and in advanced cases may be very defective. A highly protein diet raises the output of nitrogen in the urine as in a healthy person, but the increase is often out of proportion to the intake and remains so, or even tends to increase, as long as the excess is continued. A diminution of the protein, on the other hand, will frequently bring down an excessive excretion of nitrogen in the urine more than can be accounted for by the lessened intake of nitrogen in the food. This probably is to be accounted for by an increased susceptibility of the diabetic to the specific dynamic effect of protein, with a consequent tendency to abnormal tissue waste, owing to the defective utilization of carbohydrates.

The addition of protein foods to the diet of diabetics frequently fails, therefore, to accomplish its aim, and instead of improving nutrition only raises the level of metabolism and promotes tissue waste. In cases in which the utilization of sugar is very defective an increase in the glycosuria also results and the excretion of oxybutyric acid and acetone bodies rapidly rises, owing to the inability of the tissues to oxidize the sugar and fatty acids derived from the non-nitrogenous portion of the amino-acids formed from the ingested and broken-down tissue proteins.

The prognosis in a case in which the output of nitrogen in the urine regularly exceeds the intake in the food is always serious, for unless nitrogenous equilibrium can be established loss of weight and strength must continue, while the tendency will be for the glycosuria and acidosis to increase. Systematic reduction of the protein intake, guided by daily analyses of the urine, often suffices to control the condition, but rest in bed, with freedom from excitement and worry, is sometimes also necessary. The free use of opiates may be required occasionally. In Cammidge's own practice he now very rarely uses preparations of opium except in severe cases in which nitrogenous equilibrium cannot be established by any other means.

WHAT STOMACH SYMPTOMS JUSTIFY SURGICAL INTERVENTION.

TINKER in the *New York State Journal of Medicine* for December, 1915, states that a study of the results of the most experienced workers in this field leads to the conclusion that surgical intervention is justified in a large number of cases on the basis of a carefully taken history alone. When the history brings out repeated attacks of indigestion with intervals of good health, severe epigastric pain, frequent vomiting, hunger pain and relief by taking food, unrelieved by a reasonable number of weeks of medical treatment, operation seems justified. If, in addition to this, the *x*-ray shows delay in emptying the stomach from partial obstruction, deposit of bismuth in chronic perforated ulcer or great irregularity in stomach contour, the indication seems still stronger. If gastric contents analysis shows hyperacidity in ulcer cases or absence of free hydrochloric acid with lactic acid in cancer cases, this is also strongly confirmatory evidence. Blood, though not so frequently present, either vomited or obtained microscopically or shown as occult blood in the stools, is also valuable evidence.

While it may be impossible to arrive at a definite diagnosis in many of these cases, it is almost always possible, Tinker believes, to say that serious trouble is present inside the abdomen, and the symptoms are of sufficient gravity to justify surgical intervention. Almost always it will be possible to determine with some degree of certainty whether the stomach and duodenum are at fault or whether the stomach symptoms are caused by lesions elsewhere in the abdomen. All modern means of diagnosis should be employed and the lesion located as definitely as possible so that in the majority of cases the operation is not really exploratory, but

we may be able to attack the lesion causing the symptoms without undue handling of the intestines or manipulation inside the abdominal cavity.

METHYLENE BLUE IN THE TREATMENT OF "FLAGELLATE-DIARRHEA" AND OF KALA-AZAR.

CASTELLANI in the *British Medical Journal* of November 27, 1915, recalls that several authors have recently called attention in the *British Medical Journal* to the presence of flagellates in cases of diarrhea, and discussed their etiological rôle. When present in a small number such flagellates are probably harmless. In the tropics they are found in the stools of more than 25 per cent of apparently healthy persons after a saline purge. When present, however, in enormous numbers, as in the two cases Castellani published in the *British Medical Journal* of November 11, 1905, the probabilities are that they play a part in the causation of the intestinal symptoms.

He can confirm Low, Wenyon, Ledingham, and Penfold's experience that ipecacuanha and emetine have no effect on such parasites. He recommends instead the use of methylene blue. This drug has a powerful effect on flagellates. Castellani quotes a paragraph from his paper on the resistance of the intestinal flagellates to various chemical substances:

"The action of different chemicals on the parasites was tried repeatedly. Without referring in particular to all the experiments made, I may say that methylene blue solutions are without doubt the most active—much more so for instance than quinine solutions. Mixing one loopful of the stools with one loopful of 1-in-1000 solution of methylene blue and observing the preparation microscopically, the flagellates (Trichomonata and Cercomonata) are seen to take up the color, and stop almost instantly their movements, losing their ordinary shape and becoming globular without exhibiting any flagella or undulating membrane."

Castellani gives methylene blue by the mouth, in cachets containing 2 or 3 grains of the drug, three times a day, and also by intestinal irrigation (1 in 5000 or 1 in 3000). The patient must be informed that his stools and urine will become blue. The treatment has induced in most of his cases a rapid decrease or complete disappearance of the flagellates within a very few days. In a few obstinate cases the administration of the drug may have to be persisted in for a long period of time. In such a contingency the methylene blue should be discontinued from time to time to prevent the formation of methylene blue concretions in the intestine.

ALOPECIA AND ITS TREATMENT.

Writing in the *Practitioner* for December, 1915, SIBLEY says that before attempting to treat any case of baldness a definite diagnosis of the pathology must be made out, or time and labor will be wasted and much harm may result. For instance, if a scalp, the condition of which is obviously an inflammatory one, be treated with stimulating or irritating applications, the process will be greatly aggravated, and much permanent harm may ensue.

If, on the other hand, the scalp is one which is pale and anemic without any obvious naked-eye pathological changes, and an ordinary sedative be applied to the scalp, the condition cannot be improved, and valuable time may be lost, for there is no doubt it is much easier to arrest a commencing baldness than it is to restore the growth of hair which has once been lost.

The treatment, in the majority of cases of baldness in young people, resolves itself into the effective and scientific treatment of seborrhea capitis. First arrest then cure the seborrhea, and if this is not of too old standing a regrowth of hair will occur.

The seborrheic scalp should be washed as soon as much scurf has collected, generally not more frequently than once a week. The best shampoo is one consisting of equal parts of soft soap and spirit. If the scalp is very inflamed and sensitive, Parke, Davis & Company's extract of soap-bark (quillaia saponaria) is a useful substitute for a spirit soap solution.

The following are the drugs most frequently prescribed: euresol, hydrocyanic acid, ichthyol, lead, lysol, mercurial preparations, quinine, resorcin, salicylic acid, sulphur, and tar. Of these, resorcin will generally be found to be the most efficacious in a 2-per-cent solution. It is freely soluble in water, and should be rubbed into the whole scalp once a day. Even in a 2-per-cent solution, especially if it has been made some time, it will have a slight staining effect on fair or white hair. In these cases, euresol, which, however, is insoluble in water and requires spirit to dissolve it, may be substituted.

If a resorcin lotion is being used, care must always be taken that no alkaline preparations, such as alkaline soaps, are applied to the scalp, or a considerable dyeing of the hair will ensue. If it is desirable to add an oil to the preparation used, some tincture of soap-bark (tinct. quillaia) and not an ordinary soap should be used, such as:

℞ Resorcini, gr. x;
Ol. ricini, min. xxx;
Tinct. quillaiæ, min. xv;
Aquæ rosæ, f℥j.

Of the tarry preparations, liquid carbonis detergens for a watery, and oil of cade for an oily, preparation will be found the most useful:

℞ Ol. cadini,
Sp. rectif., ää min. x-lx;
Paraffin. liquid., q.s. ad f℥j.

If the scalp is red and inflammatory, the following are useful prescriptions:

℞ Liq. carbonis deterg., min. xx;
Acid. hydrocyan. dil., min. v;
Glycerini, min. x;
Aquam rosam, q.s. ad f℥j.

Or,

℞ Liq. plumbi subacet. fort., min. x;
Liq. carb. deterg., min. xv;
Glycerini, min. xxx;
Aquam rosam, q.s. ad f℥j.

Salicylic acid, a most useful preparation in seborrhea, is insoluble in water, and requires a considerable amount of spirit to dissolve it, but in cases of an oily seborrhea it is very beneficial.

Sulphur, another favorite preparation for seborrheic conditions, can only be applied in a lotion in suspension. Ichthyol is soluble in water, and may be substituted; its color and odor, however, are objectionable. Thiol and thigenol are also useful for lotions.

Having cured the seborrhea, a more stimulating preparation may be substituted, the condition of the scalp being carefully watched from time to time to determine the recurrence of any early signs of seborrhea, when the stimulating applications must at once be stopped. The following are the preparations most commonly prescribed as excitants or stimulants of hair growth:

Ammonia, cantharides, carbolic acid, chrysarobin, formalin, and lysol. Of these, lysol, in from 1- to 10-per-cent solution, will be found the most efficacious, if the objection to its odor, which is difficult to disguise, is not insuperable.

When it is realized that the morbid process occurs not on the surface of the skin, but in the sebaceous glands and hair follicles, and that no medicinal preparation, as applied in the form of a lotion or ointment, is absorbed by the skin, and that even the powers of penetration of a liquid application are very limited, a comparative failure in many cases of any of the above remedies is easily understood.

OBSERVATIONS UPON THE ETIOLOGY AND TREATMENT OF HEART DISEASE.

In the *Louisville Monthly Journal of Medicine and Surgery* for December, 1915, WHITE of Boston reaches these conclusions:

1. The male sex has been found to be more subject to auricular fibrillation, auricular flutter, heart block, and alternation of the pulse than has the female sex.

2. The older the patient with heart disease the more subject he has been found to be to serious abnormalities of the heart-beat.

3. Auricular fibrillation and alternation of the pulse occur at the same ages, most frequently in the fifth and sixth decade.

4. Rheumatic hearts usually show normal

mechanism or auricular fibrillation, much less commonly pulsus alternans.

5. A considerable percentage (36) of syphilitic hearts show alternation of the pulse; few were fibrillating.

6. A patient with cardiac insufficiency in the course of cardiorenal disease is very apt to show pulsus alternans, either constant or more frequently after ventricular premature beats.

7. Cardiosclerosis often results in the production of fibrillation and alternation.

8. Hyperthyroidism of long standing is sometimes attended by auricular fibrillation.

9. Alcohol, tobacco, tea, and coffee appear to play no direct part in the production of serious disorders of the heart-beat.

10. Two-thirds of the patients with auricular fibrillation, one-half of those with alternation of the pulse, and one-third of those with normal mechanism in his series, showed physical signs of cardiac insufficiency.

11. Digitalis was used in 88 per cent of these decompensated cases, almost always in the form of pills of standardized leaves. Intravenous medication was used in urgent cases only.

12. Morphine was given beneficially in nearly one-half of these patients with physical signs of insufficiency, often one dose sufficing to give the patient the first comfortable night in weeks.

13. Venesection was found useful in a few urgent cases.

14. The change in diet to five small meals daily was often much appreciated by the patient.

THE TOXICITY OF EMETINE.

In the *Journal of the Royal Army Medical Corps* for January, 1916, BALFOUR and PYMAN state that medical officers treating cases of amebic dysentery with emetine will do well to remember:

1. That emetine is a very costly drug.

2. That if it is going to do good its beneficial action is generally quickly apparent.

3. That it is useless, unwise, and wasteful to subject patients to repeated, long-continued courses of the drug. They know very little about the possible cumulative effect of emetine. There may be none, but in any case two short courses of the drug in appropriate doses will usually suffice to cure a case of amebic dysentery. This would necessitate a primary administration in all of from ten to fifteen grains, and accords with the experience of Low in his recent article on the treatment of amebic dysentery.

4. That emetine may itself produce and keep up a certain degree of diarrhea from that caused by intestinal disease.

THE PROBLEMS OF NEPHRITIS FROM THE CLINICAL STANDPOINT.

In the *American Journal of the Medical Sciences* for December, 1915, ELLIOTT states that the history of diet therapy in nephritis is dominated by the principle of protein restriction. Modern research during the past twenty years has borne particularly on the mechanism and consequence of retention in nephritis, and the idea of sparing the kidney has been the first rule in diet. In acute nephritis, and during the acute inflammatory exacerbations of chronic nephritis, a large protein intake is undoubtedly unphysiological and exercises an unfavorable influence. During the stormy but relatively short session of acute nephritis the eliminative functions of the kidney are carried on with difficulty, the renal filter at times refusing even to pass water through it. Attention should consequently be concentrated on the diseased organ, and until convalescence is established, low food intake, even at times to the point of starvation, will best serve the interest of the patient. In such cases for the period necessary the nutritive problem may be submerged in the imperative needs of the choked and irritated kidneys.

In chronic nephritis we are compelled to keep the general condition of the patient more in view. Granting the clinical justification of the protein conservatism in the diet therapy of chronic nephritis, it is probable, speaking generally, that its severity

and duration are much less influenced by manipulation of the protein ration than is commonly supposed. Our efforts in this direction have hitherto been governed by empiricism without scientific means of control, and we consequently have been far too much influenced by routine in the hope of controlling nitrogen excretion, which, after all, can hardly be considered an accurate measure of the gravity of the case. In chronic nephritis, nitrogen excretion is variable beyond explanation, and peculiar kinds of diet do not appear to influence it to any important extent.

So far as can be seen at the present time the only reliable criterion available for regulating the protein intake in nephritis is the determination of the amount of waste nitrogen retention by blood analysis. That it is possible to reduce the urea and waste nitrogen of the blood to normal or less is abundantly proved by the feeding experiments of Folin, Denis, and Seymour, and Frothingham and Smillie. Cases with considerable retention require a restriction of protein, and by this means a return to normal figures may be brought about if the azotemia be not too severe. In cases of outspoken uremia no marked reduction of the azotemia results from a protein-free diet.

Folin, Denis, and Seymour state that the response to the phthalein function test can be reduced by one-half before abnormal accumulation of non-protein nitrogen takes place in the blood. This estimate is in keeping with Agnew's statement that at 40-per-cent phthalein excretion cumulative phenomena appear in the blood. In clinical practice then it may be assumed that accumulation of waste in the blood begins at about the point where response to renal function testing by phthalein drops to 40 per cent in two hours. Routine observations with this readily available test may thus enable one to appreciate, with much greater precision than is possible from clinical observation alone, the point (40 per cent or lower) where positive protein restriction should begin. When the functional index is normal or nearly normal in contracting kidney it is difficult to understand what harm will result to the organs, provided no inflammatory element is present, from a protein allowance based on physiological needs. This being the case, we need no longer feel that some trifling miscalculation in the protein ration will jeopardize the welfare of the nephritic patient, nor that it is necessary to draw fine distinctions between various forms of protein.

Aided by periodic functional testing to check up the condition of the kidneys, and with our present knowledge of physiological food requirements for good nutrition, the dietotherapy of chronic nephritis may be adopted with reasonable safety, if not, perhaps, with accuracy, and with due realization that in so chronic a disease general nutrition and kidney conservation should stand on a parity.

ON THE TOXICITY OF VARIOUS COMMERCIAL PREPARATIONS OF EMETINE HYDROCHLORIDE.

LEVY and ROWNTREE (*Bulletin of the Johns Hopkins Hospital,* February, 1916) state that as the result of an investigation they made the following facts were brought out:

1. Various commercial preparations differ widely in toxicity. The therapeutic dose (mg. per kg.) closely approximates that necessary to produce toxic symptoms.

2. When intravenously administered, emetine is a powerful cardiac poison, causing at times fibrillation of the ventricles, from which the animals may recover. It is also a circulatory and respiratory depressant.

3. In fatally poisoned dogs, the characteristic lesion is a hemorrhagic gastroenteritis. Lesions in cats and rabbits are slight and inconstant.

4. The factors of blood coagulation are disturbed in poisoned animals.

5. There is found no evidence of renal insufficiency; a slight terminal acidosis is present.

On reviewing the reported cases in which ill effects have followed the clinical use of

emetine, it is apparent that diarrhea is an early toxic manifestation and that peripheral neuritis is one of the most frequently observed sequelæ, even after the administration of therapeutic doses.

As a result of these observations, it is suggested that emetine preparations be employed with caution. It is desirable that the drug be given subcutaneously, in courses, at intervals of several days or a week. A third of a grain three times a day, for a week or ten days, is usually a safe dosage in amebic infections. According to Bass and Johns, half a grain daily for from three to six days suffices in pyorrhea. Large doses should be avoided. Intravenous injections should be employed only in extreme cases. If this mode of administration seems imperative, small doses, well diluted (gr. ss in 100 Cc. salt solution), should be slowly given, and the blood-pressure should be carefully observed during the injection.

ON THE BACTERIAL POWER ACQUIRED BY THE SERUM AFTER THE ADMINISTRATION OF SALVARSAN OR NEOSALVARSAN.

In the *Lancet* of January 22, 1916, DOUGLAS and COLEBROOK reach these conclusions:

1. Neosalvarsan and salvarsan in watery solutions possess a very distinct bactericidal power against staphylococcus when the strength of the solution is 1 in 6000. When the solvent largely consists of blood or serum this power is slightly diminished. The bactericidal power of solutions of both these preparations appears to be practically the same.

2. The administration of neosalvarsan in ordinary doses renders the blood fluids markedly bactericidal. This power lasts but a short time, and seems to reach its maximum about one hour after the administration of the drug, diminishing rapidly in the third and fourth hours.

3. Heating the serum to 60° C. for from ten to twenty minutes has no deleterious effect on this bactericidal power, showing that it is not in any way due to the development of immune bodies in the serum, and this fact, together with the short period in which the serum is found to be bactericidal, strongly suggests that the bactericidal power is due to some arsenic compound in solution in the blood serum.

4. Salvarsan, which, as mentioned above, has almost identically the same bactericidal power as neosalvarsan in *in vitro* experiments, gave practically no demonstrable bactericidal power to the patient's serum when ordinary therapeutic doses were administered, but it was constantly noticed that organisms which had been treated with serum obtained within three hours of the administration of the drug grew very much more slowly than normally and were agglutinated into masses.

5. In view of the very distinct bactericidal power which the serum acquires after the administration of neosalvarsan, it is reasonable to hope that the administration of this drug, or some similar preparation such as neokharsivan, would have a beneficial effect on wound or other similar septicemias, and might even strikingly assist in the sterilization of deep and irregular suppurating wounds.

THE TREATMENT OF PARESIS AND TABES DORSALIS BY SALVARSANIZED SERUM.

In the *American Journal of Insanity* for January, 1916, COTTON concludes a long article on this subject, in which he emphasizes:

1. The fact that in the use of salvarsanized serum we have an agent which causes definite arrest in paresis, which arrest includes improvement in the clinical symptoms, physical signs, and a corresponding change in the biological reactions from positive to negative.

2. That to be effective the case must be treated in the early stages, as advanced stages show no favorable reaction to the treatment.

3. That the length of time is not always an indication of the severity of the symptoms, but the majority of cases cannot be

helped after two or three years have elapsed.

4. That treatment must be persistent and uninterrupted, grading the amount of dose and frequency of treatment to the condition of the patient.

5. That taboparesis should be cautiously treated, usually with small doses and not oftener than three weeks.

6. That the remission caused by the treatment cannot be compared to spontaneous treatment, for the percentage in the former is 35.5, and in the latter case only 4.

7. That the change in the cell count, globulin content, blood and spinal fluid Wassermann reactions are the direct result of the treatment, and not to be compared with the variation found in untreated cases of paresis.

8. That the efficacy of the treatment depends not upon the type of method used but upon the stage of the disease.

9. Hence the necessity for early diagnosis in paresis and prompt treatment as soon as possible.

A QUANTITATIVE STUDY OF THE ANALGESIA PRODUCED BY OPIUM ALKALOIDS, INDIVIDUALLY AND IN COMBINATION WITH EACH OTHER, IN NORMAL MAN.

In the *Journal of Pharmacology and Experimental Therapeutics* for January, 1916, MACHT, HERMAN and LEVY reach these conclusions from an investigation:

1. A convenient method for studying cutaneous pain sensation in man quantitatively and expressing the results in absolute physical units has been described.

2. The principal opium alkaloids in respect to their analgesic power can be arranged in the following order: Morphine, papaverin, codeine, narcotin, narcein, and thebain.

3. It has been found that a combination of morphine and narcotin, and also a combination of the total opium alkaloids, is much more effective than the quantity of morphine they contain would be if given alone.

4. It has been further found that in the case of one of the authors showing an idiosyncrasy for morphine, that alkaloid produced a heightening instead of a lowering of the threshold of pain, which phenomenon, however, disappeared on administering morphine in conjunction with narcotin.

SOME OBSERVATIONS ON THE ELIMINATION OF HEXAMETHYLENETETRAMINE (UROTROPIN).

The *Journal of Pharmacology and Experimental Therapeutics* for January, 1916, contains an article on this topic by FALK and SUGIURA. In conclusion they say:

1. A method for the estimation of hexamethylenetetramine is described.

2. The total and percentage amounts of hexamethylenetetramine recovered in the urine of normal (average) individuals after administration by mouth were determined and some of the factors involved in the excretion are discussed.

3. In general terms, the amount normally excreted is greater the lower the specific gravity of the urine.

4. The concentration of formaldehyde in urine had no apparent connection with the amount of hexamethylenetetramine excreted.

5. In a number of pathological cases involving impairment of kidney function, abnormally small amounts of hexamethylenetetramine were excreted.

THE COMPARATIVE PHARMACOLOGIC ACTION OF ETHYLHYDROCUPREIN (OPTOCHIN) AND QUININE.

Writing in the *Journal of Pharmacology and Experimental Therapeutics* for January, 1916, SMITH and FANTUS tell us:

1. The pharmacologic action of optochin is qualitatively like that of quinine. The differences are quantitative.

2. Optochin is more toxic than quinine. In view of its considerable degree of toxicity, they would urge caution in the clinical use of optochin, especially in its intravenous administration.

3. Optochin administered intravenously

lowers the blood-pressure somewhat less than quinine, though it depresses the heart more. The peripheral vasoconstriction probably counteracts partly the effects of cardiac depression. The blood-pressure is not a safe guide in the administration of optochin.

4. Optochin is less efficient as an antipyretic than quinine in experimental fever in rabbits.

5. Lastly, since it has been advocated for local use in eye infections, it is important to note that even a 2-per-cent solution of optochin is highly irritant to the conjunctiva.

DOES THE PITUITARY GLAND CONTAIN ADRENALIN OR A COMPOUND SIMILAR TO IT?

In the *Journal of Pharmacology and Experimental Therapeutics* for January, 1916, WATANABE and CRAWFORD answer this question as follows:

1. Pituitary extracts prepared by certain methods give color reactions similar to those given by suprarenal extracts.

2. Slowing of heart-rate (dog) was noted from a preparation in which no pressor action was detected.

3. Pituitary extracts cause a strong contraction of non-pregnant cat's uterus. A certain amount of adrenalin when mixed with pituitary extract does not change the characteristic action of pituitary extract on the cat's uterus.

4. After ergotoxin injection, pituitary extract causes a lowering of blood-pressure as by adrenalin. This suggests that some of the action of pituitary extract is on the sympathetic nerve terminals.

5. Isolated loops of rabbit's and cat's intestine are strongly contracted by pituitary extract. Relaxation of the intestine was not obtained by the addition of a certain quantity of adrenalin to such extracts.

6. By oxidation with MnO_2, pituitary extracts lose their pressor action and some of their color reactions, but retain at least to some extent their action for both non-pregnant cat's uterus and rabbit's and cat's intestine.

7. Several methods for isolation of adrenalin were tried on the pituitary glands, but were unsuccessful.

MODERN THEORIES OF PASTEURIZATION.

Bulletin No. 342, United States Department of Agriculture, January 8, 1916, treats this topic in detail. It points out that one objection to pasteurized milk has been that bacteria grow faster in it than in raw milk. In spite of several experiments which seem to prove this point, it has never been thoroughly established. It has been found that the rate of bacterial increase is approximately the same when the comparison is made between raw milk and pasteurized milk having about the same bacterial content.

It is often stated that pasteurization, even if it does destroy bacteria, does not destroy poisonous products of their growth. This can hardly be considered a real objection, for if they are present in raw milk they must be consumed with it, and if pasteurization does not destroy them the pasteurized milk would be no worse than the raw milk.

The question as to whether pasteurization destroys beneficial ensymes is still an open one. In the light of our present knowledge of the enzymes in milk and the part they play in the digestive process it is quite impossible to settle the question of their importance. It is evident, however, that the low temperatures now in use in pasteurization have little effect on the recognized enzymes.

The opponents of pasteurization have raised an objection on the ground of its direct influence on the milk producer. It has been asserted that pasteurization would cause lax methods of production on the farm, for the reason that farmers would know that the milk was to be pasteurized, and, therefore, they could be careless in its production. There seems to be some basis for this objection, but in any city where there is any inspection of the raw-milk supply the same inspection can and should be

continued even though the milk is to be pasteurized.

From a chemical standpoint serious objections have been raised against pasteurized milk, because the heating produces changes which render the milk less digestible, particularly in the case of infants. Rupp has found that milk pasteurized at 145° F. for thirty minutes does not undergo any appreciable chemical change. He found that soluble phosphates do not become insoluble, that the albumin does not coagulate, and that when higher temperatures are used chemical changes do occur. He also developed the fact that five per cent of the albumin is rendered insoluble in milk heated for thirty minutes at 150° F., while at 160° F. 30.78 per cent of the albumin is coagulated. It is evident that the use of low temperatures for pasteurization overcomes any objections which may be raised on the ground of chemical changes.

Further evidences that low temperature pasteurization does not injure the digestibility and nutritive value of the milk is shown by the results of feeding experiments on babies. According to Weld a number of babies that were fed raw milk and pasteurized milk showed only a slight difference in the average net daily gain in weight during the feeding period. The slight difference was in favor of pasteurized milk.

High-temperature pasteurization of earlier days must not be confused with low-temperature pasteurization of the present day. Many of the objections which have been raised to pasteurization have been founded on the observation of milk heated to high temperatures. Unfortunately, not until recently has the use of low temperatures entirely changed our views in regard to the value of pasteurization. The fallacy of the objections to pasteurization has been shown, however, through scientific research in the past few years, and as a result the value of the process has been firmly established.

Although pasteurization is being more extensively practiced in most cities, particularly the larger ones, there are health departments in some of the smaller cities which are strongly opposed to the process; there are also many people who object to it. The problem of pasteurization is not based simply on the question of which is preferable, raw or pasteurized milk, but rather upon the most economical and practical way of producing a safe milk supply. In small cities where money enough is available to pay for inspection, and where the milk supply is drawn from farms within a short distance of the city, it may be feasible, without pasteurization, to bring the supply to a point of reasonable safety. To produce, however, the same degree of safety in the supply of a large city by inspection would involve a tremendous expense.

Let us consider for a moment the supply of New York City, which in 1912 amounted to about 2,500,000 quarts daily. This milk came from 44,000 farms in six States, and was the product of about 350,000 cows. Some of it had to be transported 400 miles or even more. It was estimated that 127,000 people were engaged daily in handling the milk supply of that city. It is hardly necessary to discuss the magnitude of a system of inspection suitable to guarantee a safe milk supply of this size.

There is, of course, in the large cities a small quantity of high-grade raw milk, but it is produced under special conditions and sells at a higher price than regular milk. The cost of such milk makes it prohibitive for use in poor families. The means of creating a safe milk supply for general consumption, especially for large cities, is, then, in inspection, developed to the highest practical degree, followed by proper pasteurization.

It seems probable that within the next few years a large proportion of the milk supply in American cities will be pasteurized. This condition will come first in the larger cities, where the safeguarding of the milk supply is a more difficult problem. For economic reasons, and in recognition of the process as a means of eliminating certain risks which cannot be completely eliminated in any other way, the pasteurization of milk is certain to be the general practice in this country.

THE VALUE OF DIASTOLIC BLOOD MEASUREMENT IN DIAGNOSIS OF CIRCULATORY DISTURBANCES.

In the *Cleveland Medical Journal* for December, 1915, BOWMAN writes on this important theme, pointing out that until within the past two or three years the diastolic blood-pressure was considered of no importance. Cabot in his 1912 edition says: "Very little of diagnostic or prognostic value attaches to it in my experience." But very recent observers have found it to be of great value in clinical work. However, before entering upon a discussion of its value in the diagnosis of circulatory disturbances, it would seem advisable to refresh our memories by briefly stating a few points concerning it.

First, what is diastolic blood-pressure? With each ventricular systole waves of pressure are thrown into the aorta and these continue on into the arteries. The highest pressure attained in this stream of blood is known as the systolic pressure. But part of this energy expended by the heart becomes potential energy, stored up as it were in the distended, elastic arteries, and when the high pressure has passed these distended walls tend to return to their normal size and thus exert a constant pressure on the blood within the vessels. This constant pressure represents the diastolic pressure, and may be defined as "the lowest pressure occurring between the heart-beats." The difference between the systolic and diastolic pressure is termed the pulse pressure. Each of these pressures is given in terms of the height in millimeters of a column of mercury; systolic being about 115 mm., diastolic about 80 mm., and pulse pressure about 35 or 40 mm.

Secondly, its maintenance. Diastolic blood-pressure is maintained by and depends upon the elasticity of the vessel walls plus peripheral resistance.

Thirdly, its measurement. There are two methods used, the auscultatory and the oscillatory. In both cases a cuff about twelve centimeters in width and which can be inflated is placed around the arm or leg, and the measurement depends upon certain changes occurring when the pressure in the cuff is equal to the diastolic pressure. The change in the auscultatory method is in the sound below the cuff detected by a stethoscope, while in the oscillatory the change is in the pulsations of the manometer connected with the cuff. The auscultatory method is by far the more valuable of the two.

Regarding the value of diastolic blood measurement in the diagnosis of circulatory disturbances: In the first place its measurement serves as an index to the load which the vessels and the aortic valves must constantly bear. Throughout the diastole of the left ventricle these valves must stand guard and support this diastolic pressure or else blood will flow back and the circulation be diminished. The measurement of the diastolic blood-pressure accurately records this pressure or load which the vessels and valves must bear.

In the second place and viewed from the standpoint of the heart we readily see that this same load upon the aortic valves, due to diastolic pressure and coming from the arterial side, must be overcome on the other side at the beginning of each ventricular systole before the valves can be forced open and blood thrown into the circulation. This means work for the heart, and here again the measurement of the diastolic pressure gives us an estimate of the load which it must lift before any blood leaves the heart.

Now what is the value in the diagnosis of circulatory disturbances of knowing these things? From the view-point of the vessel walls and valves suppose we had a high systolic pressure with a normal diastolic, what would it mean? Would it mean excessive strain for the vessel walls, valves, and heart? Probably so, but the systolic pressure is transient and following each wave there is rest. Now suppose we had a high diastolic pressure in the above condition. What would it mean?—excessive weight on the arterial walls and valves, and on top of this no rest, for the diastolic is a constant pressure; also there would be an abnormally heavy load for the heart to raise

before the aortic valves are forced. Hypertrophy of the heart walls, degeneration of the arterial walls, and what not may occur.

Diastolic blood-pressure gives us valuable information in regard to peripheral resistance. Dr. Warfield of Milwaukee says it "measures peripheral resistance." Dr. Macleod speaks of it as helping to "gauge peripheral resistance."

In the first condition suppose we had a case of hypertonicity, or sometimes called hypertension. Here we find fairly healthy arteries much constricted. This increases blood-pressure, and accordingly systolic blood-pressure. If the arterial walls are healthy this will also increase the diastolic pressure, for the greater the force required to dilate the arteries the greater will be the potential energy stored up. Here we have a high systolic with a high diastolic. What does it mean? Evidently it means greater strain on the vessel walls and the valves, and increased work for the heart. Remember this is a constant pressure in the sense that it is the pressure in the arteries between the heart-beats, and, on the vessel walls especially, entails a greater strain than the transient systolic. It "should be taken as a danger-signal of possible rupture." Bowman thinks it safe at least to draw a general conclusion in such cases that the greater the strain the more subject these organs are to degeneration.

The second case is that of arteriosclerosis of the Gull and Sutton type, by which Bowman means a condition in which the smaller arteries and arterioles are affected. The walls are stiffened and less potential energy is stored up, and correspondingly the lower is the diastolic pressure (if they were perfectly rigid the diastolic pressure would be zero). To maintain the circulation the heart is called upon for more rapid pulse or greater force, possibly both. This is a case of high systolic and low diastolic pressure. The result is a less constant pressure but an enormously increased pulse pressure and cardiac activity, which eventually mean hypertrophy and degeneration of the heart along with that of the arteries.

The third condition is that of hypotonicity. Here the tonicity of the vessel walls is lowered. Accordingly we have a relaxed periphery and a correspondingly lowered diastolic blood-pressure. The blood is forced into the vessels, but the vessels fail to contract down upon their volume—*i.e.*, the diastolic pressure is not present to give the constant pressure necessary to squeeze the blood through the capillary system and furnish food to the tissues and organs. Such cases may occur in toxic paralysis of the vasomotor center and in general cardiac weakness. The heart is possibly called upon to offset the evil.

In connection with these cases it might be well to give a quotation from Dr. Macleod's article in a recent journal. In refering to allied conditions he says: "In using the diastolic pressure, however, it must be remembered that the heart-rate also affects it, a slow heart making it fall and a quick heart making it rise. It is therefore possible to have a normal diastolic pressure, either with a low peripheral resistance and a quick pulse, or with a high peripheral resistance and a slow pulse. In these cases the arterial walls may be perfectly healthy."

So, in the fourth place, the measurement of the diastolic finds its greatest value, Bowman thinks, by the help it gives in diagnosing the conditions of the circulation through its relation to the systolic and pulse pressures. It is of extremely great value in itself alone, but we can recall from the instances used above that it finds an added value in its relation with the others.

THE RELATION OF MORPHINE TO POSTOPERATIVE COMPLICATIONS AND IMMUNITY.

In the *Journal of the American Medical Association* of January 22, 1916, DAVIS as the result of an investigation of this matter states that the combination of morphine (from one-eighth to one-sixth grain) and atropine (from 1/150 to 1/120 grain) hypodermically before operations is of very little importance so far as the prevention of postoperative shock is concerned, and in the general run of cases plays a negligible part

in the production of postoperative nausea and vomiting, tympanites and paralytic ileus, and postoperative retention of urine. It has practically no effect on immunity. Morphine alone, preceding local anesthesia, adds nothing to the efficiency of the anesthetic, and causes postoperative nausea and vomiting in 25 per cent of the patients; it makes the patient "dopey," and hence deprives the operator of the coöperation of the patient, which at times may be valuable. In view of these conditions, and in view of the disadvantages of imposing one powerful depressant of the medullary centers (namely, morphine) on another (namely, ether), the preoperative use of morphine should be abandoned. In view of the same conditions, morphine in therapeutic doses—that is, from one-eighth to one-sixteenth grain, to an adult of average size—repeated at intervals of not less than six hours, should not be denied to patients whose postoperative suffering cannot be controlled otherwise.

THE BACTERICIDAL ACTION OF NORMAL AND INFECTED SERA UPON DIFFERENT MICROBES.

In the *Lancet* of January 15, 1916, SAKAGAMI states be has drawn the following conclusions regarding this problem:

1. The following microbes grow in normal serum: staphylococcus pyogenes, pneumococcus, pseudo-tuberculosis, streptococcus pyogenes, and M. catarrhalis.

2. Normal serum has a small bactericidal action upon staphylococcus during the first hour of exposure, but after many hours its power decreases. Serum heated to 60° C. has no power. Normal serum has no bactericidal power upon the streptococcus.

3. Serum of tuberculous patients has smaller bactericidal power than normal serum upon the staphylococcus and streptococcus. Serum of those suffering from staphylococcal infections has a little stronger power than that of tuberculous patients. The serum of those suffering from tuberculosis and staphylococcal infections at the same time has more power than the serum of those suffering from tuberculosis only.

4. The bactericidal action of Sakagami's own serum after he had been inoculated with cholera and typhoid mixed vaccine was noticeable on both these bacteria, but otherwise was unchanged.

THE TREATMENT OF DYSENTERY.

RONALD ROSS in the *Lancet* of January 1, 1916, states that the treatment of running acute dysentery is the great problem in most cases, and, he regrets to say, one which cannot always be solved, as admitted by some of the most experienced practitioners in all countries. Here the mischief has been already accomplished, and we are probably in the presence of an almost denuded colon. He tried antidysenteric sera in many such cases on the mere chance that they might destroy the specific bacteria if present, there being generally not sufficient time to make minute pathological studies. And the treatment was said by many to be remarkably beneficial in a certain proportion of cases. But others were not so favorably inclined to it, and others again argued that an ordinary horse serum would probably have been just as useful. Ross has suggested that polyvalent sera might be put on the market against other intestinal flora than the specific ones, and hopes that such will be tried before long.

Failing sera, he had recourse to medicinal treatments. He always urged the bismuth treatment elaborated by Deeks in Panama, and consisting of a heaped tablespoonful of the subnitrate three or four times a day. The utility of this medication is supposed to depend not only upon the astringent value of bismuth, but also upon a chemical change, and lastly upon the mechanical action of the powder, which is likely to injure amebæ by attrition. At all events, bismuth in these and smaller doses is very generally given in dysentery, was largely employed throughout the hospitals in Alexandria, and certainly, Ross thinks, proved distinctly useful. It was generally administered continuously, beginning a day or

two after the initial treatment with emetine was commenced.

Ross has always liked tannic acid in conjunction, say up to ten grains for each dose.

In fact, tannic acid has been used for a long time, and was often administered together with ipecacuanha powder, because it tends to check the vomiting induced by the latter, as well as because of its astringent effect. But it is a good general rule not to use any astringents at all too early —that is, until the specific remedies have had time to take effect. After that happens, however, opium, bismuth, tannic acid, catechu, and other astringents do often succeed in terminating the attack very rapidly. Ross regrets to say, however, that many cases become cases of established running dysentery in spite of all treatment.

Collapse is another very difficult condition to deal with. Lieutenant-Colonel A. H. Lister, of one of the hospitals in Alexandria, often used the subcutaneous infusion of hypertonic salines together with ten minims of adrenalin solution, 1 in 1000, every four hours, injected hypodermically, with very good results, and strongly recommends the adrenalin.

Opium is, of course, an invaluable drug throughout the treatment, and though some practitioners appear to be nervous about it, Ross thinks that the use of it is really general at all stages.

Ross now comes to a very vexed question—namely, the use of enemata in acute dysentery. There is no question of their use in chronic dysentery, especially of low-down ulceration; but some of us feel that they are contraindicated in very early cases. The disease is itself complicated with purging, and if the sulphates are being given at the same time, there is a continual washing out of the bowel from within. In such cases Ross really cannot understand the rationale of using massive lavations, which depress the patient and may even rupture the very thin walls of the ulcers; and we never know how old and thin the ulcers may be. Others object to them on the ground that they may engender secondary infections from without; and he has a feeling that enemata are somewhat too frequently followed by running dysentery.

Such a great authority as Professor Kartulis is confident that tannic acid is most beneficial from the first. Rogers often recommended quinine lavations. Colonel Lister was an advocate of three or four ounces of olive oil containing a drachm of ichthyol, preceded by a morphia suppository half an hour before the injection. Nitrate of silver has always been employed in chronic dysentery, and Ross knows many cases in which it has certainly effected a cure; but nowadays we should use protargol or similar salts—and these were employed with fairly good results in many of his fresh cases. If lavations are employed at all, he likes warm water without salts, as it swells up and destroys amebæ; or warm and weak permanganate solution, or warm and weak solution of quinine. But he still does not favor this form of medication very much in acute dysentery.

THE TREATMENT OF UTERINE HEMORRHAGE BY THE ROENTGEN RAY.

CORSCADEN (*American Journal of Obstetrics,* January, 1916) states that the technique followed has been to divide the abdomen below the umbilicus into nine areas, using the back and each buttock for three more, making a total of twelve. Through each of these in turn the rays are directed at the point where the nearest ovary is supposed to be. The size of the abdominal areas being from 5 to 6 centimeters square will allow for some error in calculation, so that most of the rays reach the ovary. The measurements of the dosage are: Distance from anode to skin 25 centimeters, spark-gap 22 to 24 centimeters, milliamperes 7, Bauer 10, filter 3 millimeters glass, 1 centimeter of wood, 3 millimeters of aluminum. This gives 1 Holzknecht unit a minute. Seven Holzknecht units are given to each skin area. The series is repeated after three weeks.

The personal results have been as follows: In twenty women of thirty-eight and over,

whether possessing fibroids or not, complete amenorrhea in 5 per cent from the onset, in 5 per cent after one period, in 5 per cent after three periods, and in 85 per cent after two periods. The first period occasionally is profuse. All of the cases have been severe enough to partially or completely incapacitate the women. Activities were resumed usually about three weeks after the first exposure.

Severe untoward effects occurred in only two cases. One suffered from nausea and diarrhea, the other from diarrhea indistinguishable from mucous colitis. Many of the women felt fatigued for a day or two and a few suffered headaches; albumin and casts appeared in the urine of one woman. No late effects other than those accompanying the menopause have been noted save in one case in which there was an attack of uremia six months after the end of treatment, in a woman suffering from large polycystic kidneys. The skin becomes tanned after two series, fading after cessation of the treatment. No dermatitis has resulted from the dosage. A small linear burn occurred in the very first case treated because of imperfect apposition of the lead protection. Slight vesication resulted, but the skin became normal again in six weeks. This accident has not recurred.

The causes of uterine hemorrhage may be divided into two classes: (1) Those peculiar to the uterus and causing normal or pathological menstruation. (2) Those common to all parts of the body regardless of sex.

Menstruation is dependent on the activities of the corpus luteum.

Roentgen rays destroy the follicle apparatus of the ovary and thereby automatically bring about a menopause.

In bleeding from the uterus without gross pathological lesion, whether accompanied by changes in endometrium or fibrosis of arteries or myometrium, production of the menopause constitutes a cure.

In women over thirty-seven this menopause is incomplete either with a temporary amenorrhea or merely a lessening of the flow.

All myomata which do not constitute an immediate or remote menace aside from that of hemorrhage are proper subjects for the production of the menopause, provided that ulcerative changes or pedunculated fibroids or polyps do not exist, and provided that the possessor be over thirty-seven years of age.

All myomata which constitute a menace in women under thirty-eight should be excised rather than be subjected to Roentgen rays unless operation is contraindicated.

In hemorrhage from malignant disease Roentgen rays are contraindicated.

THE DIAGNOSIS OF INTRACRANIAL BLEEDING IN THE NEW-BORN.

SLOAN (*Cleveland Medical Journal*, December, 1915) notes that the majority of those who recover suffer from diseases of the central nervous system—the result of scar tissue formed by the organization of the clot.

Paul found retinal hemorrhages in 50 per cent born through contracted pelves; in 40 per cent where labor was protracted; and in 20 per cent where the babies were born spontaneously.

This is attributed to back pressure in the veins of the head. The great majority of injuries occur during the descent through the birth canal. The brain of the baby is able to stand anemia or asphyxia over a longer period than is that of the adult.

The babe which has intracranial bleeding presents general symptoms of increasing intracranial pressure. If the bleeding has been of sufficient amount at the time of birth, then there is found difficulty in inducing normal respiration. The infants are restless, moving the arms and legs, as well as making facial contortions. They will not take nourishment. If nourishment is forced upon them, it causes queer choking noises in swallowing. They have a peculiar cry, aptly compared by a well-known maternity nurse to the mewing of a cat. The restlessness and crying of the child are seen more in cases of bleeding above the tentorium, undoubtedly being due to the pain

caused by stretching of the dura from the increased expansion beneath it. The child appears pale, and if attention be paid to the pulse-rate it will be found to be slower than usual. There is a tendency, however, for the pulse-rate to be affected less in rate than in the adult under the same circumstances. The pallor results from the vasoconstriction in the attempt of the body to raise the general pressure to supply blood to the cerebral cells. The fontanel becomes more tense because of the increased intracranial pressure, and one of the lambdoidal sutures where it joins the parietal over the bleeding area may be found gaping more widely than its fellow of the opposite side. The fontanel, however, may still remain sunken when there are well-marked symptoms of intracranial pressure increase associated with generalized convulsions. The pulsation of the fontanel is absent. The veinules of the eyelids which empty into the sinus cavernosus may be more prominent than usual, especially over the side where the hemorrhage has taken place.

Upon examination it may be found that the spinal accessory which supplies the sternocleidomastoid is progressively affected, showing increased muscle tone. Pressure on this nerve causes spasmodic contraction of the sternocleidomastoid, turning the head toward the side on which the bleeding occurs. Later, as pressure increases, the sinus sagittalis superior becomes obstructed from pressure contact with the clotted blood. The resultant excessive spasticity of the lower limbs then occurs because of the venous obstruction of their centers. The child becomes comatose, and as the pressure increases from the clot and cell edema there is seen the resultant muscular paralysis of the flaccid type, with lack of deep tendon reflexes. The babe's breathing is affected, first slowed and deepened, then respiration becomes rapid and shallow, blood-pressure starts to fall with the increasing rapidity of the heart-rate, and finally death results with cessation of respiration, the heart continuing to beat longer. The pupils during the irritative stage are contracted, and later on when paralysis occurs they become widely dilated and do not react to light. During the stage of irritation, namely, while the child is having clonic and tonic muscular contractions, there occur interruptions of the respiration in true convulsions with cyanosis and apnea. At the end of this convulsion, when the respiration is resumed, there is often noted in supratentorial bleeding the temporary relaxation of the vasoconstrictors, causing a wide-spread skin blush. Pressure over the fontanel may at this stage start a convulsion.

The child lies quiet, showing no movements of any extremity, and seldom cries; because if the pressure is sufficient to cause tentorial stretching and therefore pain, the medullary centers are rapidly involved, with resulting death. There is slight cyanosis of the skin instead of the pallor connected with supratentorial bleeding. This arises from early involvement of the respiratory center in the medulla. The child is liable to have nystagmus. Blood running down the spinal subarachnoid space gives symptoms of spinal irritation, namely, stiff neck, with the resulting bilateral rigidity of the whole musculature. Lumbar puncture in these cases shows cerebrospinal fluid mixed with blood, whereas in the supratentorial type the fluid may be clear, because here the bleeding usually occurs between the dura and the arachnoid. This plane is shut off from the subarachnoid space where the cerebrospinal fluid is present. As the pressure increases there is an interruption of the blood flow in the sinus rectus with the damming back of the blood flow in the venæ cerebri internæ and resultant brain edema. There is less tendency to bulging of the fontanel in the early stages, but later when the brain edema comes on the bulging may be as marked as in the supratentorial type.

In intraventricular hemorrhage the babe is restless, shows a bulging fontanel and general muscular rigidity. In every case in which there has been difficult labor, where instruments have been used or where the labor pains have had unusual force, the child should be closely watched for the first

three or four days after birth. Symptoms arising from birth hemorrhage may not become evident for five or six days later. Where there is any question of brain hemorrhage the child should be kept quiet and moved as little as possible, as any sensory stimuli are prone to cause a general convulsion. With the appearance of symptoms of general increase in the pressure, slow pulse, tense fontanel, with muscular spasms, it is wise to do a decompressive operation over the suspected area of bleeding. In cases of edema due to injury of the brain alone, without bleeding, the same rules are adopted, namely, to interfere and to do a decompression when the signs of increased pressure are marked. Although the suture lines of the cranial bones in the infant are loosely joined and although this factor may allow for a certain amount of expansion of the fetal brain, yet it may not be sufficient to tide the child over this critical period, whereas decompression may be life-saving.

The decompression should not be delayed until the compensatory stage of Kocher is passed. The best results from operation are seen when it is done while the pulse-rate is still slow and before respiration becomes irregular. The cells of the centers relieved of their compression at this stage always live. If, however, operation is deferred until signs of failing compensation are apparent through rapid heart-rate, less booming second aortic sound, and irregularity of respiration, then there is grave danger that although the operative procedure is successfully accomplished, the child will die within the next few hours because the brain cells have been irreparably damaged.

The author closes his article with the following statements:

In case of difficult or prolonged birth, where there has been a difficult instrumental delivery, or where there is tardy starting of spontaneous respiration, the babe ought to be carefully watched for the next few days to see if there is any evidence of cerebral bleeding.

Early symptoms of cortical irritation are most valuable in localization of the bleeding. Bleeding above the tentorium can be differentiated from that occurring below it. When symptoms of general increase in intracranial pressure become marked a decompression operation ought to be done.

The best results are seen when decompression is done while the pulse-rate is still slow and before respiration becomes irregular.

CLINICAL RESULTS OF 1000 INTRAVENOUS INJECTIONS OF GALYL.

SPENCE (*Lancet*, Dec. 11, 1915) records his experiences in connection with the administration of one of the newer specific remedies, galyl, in a series consisting of somewhat over 1000 consecutive intravenous injections, given principally at the London Male Lock Hospital in the period from June to November, 1915, inclusive. His remarks are confined to clinical observations only, no systematic study having been undertaken of the effect on the Wassermann reaction or of certain other questions chiefly of academic interest.

Galyl, or tetraoxydiphosphaminodiarsenobenzene, is one of several synthetic substitutes for salvarsan which have recently appeared on the market. It is the invention of a French scientist, M. Mouneyrat, and while it is a substance with a high arsenic content (35.3 per cent), it possesses some claim to originality in that it contains in its formula the element phosphorus (equal to 7.2 per cent), while the atoms of arsenic are graphically represented as differently grouped. A comparison of the full doses advised for galyl and for salvarsan and neosalvarsan indicates that galyl as administered actually contains only about half as much arsenic as the others, a point of passing interest in view of the recent suggestion that the activity of those agents may be not wholly dependent on the arsenic moiety. In the leaflet which accompanies the preparation the assertion is made that it has the advantage over the other arsenic derivatives of being non-toxic to nerve tissue.

The preparation is supplied in five different strengths—viz., 0.4 grm., stated to be the full dose and to correspond to 0.9 neo-

salvarsan; three smaller, 0.25, 0.30, and 0.35 grm.; and a larger, 0.5 grm. It is left to be inferred that the large dose is to be used only very occasionally, or in other words that it is a specially powerful one. Spence states that during a recent temporary shortage of galyl he was supplied with several 0.5 grm. tubes and used them in place of the 0.4's with indistinguishable results.

The substance itself is a light-yellow powder which looks not unlike salvarsan, is also readily oxidizable, and is put up in similar but larger tubes. It is readily soluble in distilled water, giving a clear olive-yellow transparent solution, neutral in reaction, which upon standing a few moments becomes darker in color. Perhaps this statement should be modified by saying that an occasional ampoule will be found giving a slightly hazy solution, but apparently this does not indicate deterioration, and no unusual result has been observed in such instances. It is used in precisely the same way as neosalvarsan, either in concentrated solution in the 10-Cc. piston syringe, or more dilute in the familiar burette apparatus, preceded and followed by a little distilled water. This last is the safe method where one is giving intravenous injections only occasionally, and is useful also in institutions where good assistance is available and large numbers of injections have to be given quickly.

In clearing up symptoms the new preparation differs little if at all from its older rival. Indeed, at times Spence has been inclined to think that its effect on the large papular syphilide, a lesion most resistant to salvarsan, is somewhat better, from a comparison with concurrent cases in which the latter was used. It is certain that patients experience the same feeling of buoyancy and of well-being after galyl; appetite and nutrition improve, and there is frequently an increase in sexual vigor.

Second only in importance to effectiveness in clearing up symptoms is the question of toxicity. More than 150 deaths are credited to salvarsan, to say nothing of innumerable accidents and severe reactions, mostly in the early days and variously attributed to the water used, to improper preparation of patient, to pathological condition, to too frequent administration, or to errors of technique. Nor has the use of certain other of the newer preparations been without disaster, as witness the cases so graphically described by Mr. Lane and Mr. J. E. R. McDonagh, of the honorary staff of this hospital.

No fatality has as yet been reported with galyl. Neither has there been reported any undoubted case of arsenical intoxication, but in this connection it is to be remembered that the remedy is new and its literature at the time of writing very meager. In a certain small number of cases of the present series there have been mild reactions shortly after or within a few hours after injection, but in only one did the temperature reach 104°, and in this case the presumption was strong that it was due to an endotoxic rest. If a patient has partaken of a hearty meal shortly before an intravenous injection is given, vomiting is not uncommon with any drug, perhaps with chilliness or a rigor, pyrexia, or even purging and enuresis. If, however, he has been properly prepared, has rested well, and the alimentary tract has been cleaned over night by a brisk purge and an enema if required, such symptoms are at least not usual.

FRACTURE OF THE ELBOW.

GROSSMAN (*Medical Record*, Jan. 15, 1916) concludes a clinical paper on this subject as follows:

Every case of injury to the elbow where the diagnosis is doubtful should be placed in the acute flexion position until the diagnosis is cleared up by the Roentgen ray (except fractures of the olecranon process).

Begin massage and passive movements about the tenth day, and continue thereafter until the movements in the elbow-joint are normal and free from pain.

Guard against the displacement of the fragments when passive movements are begun, as faulty reduction causes periosteal proliferation that locks the joint.

Proper retention is just as important as proper reduction.

These few precautions will prevent a great deal of unnecessary suffering and disability which usually follow too long immobilization, improper reduction, and improper retention of the elbow-joint.

A CASE OF FAILURE OF UNION BETWEEN THE VAS DEFERENS AND THE TESTIS.

WHITEFORD (*Edinburgh Medical Journal*, December, 1915) reports the following case:

The patient, aged twenty-three years, was admitted for operation on a right inguinal hernia, which had existed since birth. The right testis was absent from the scrotum. The left testis was fully developed and in its normal position. The hernial sac, which extended into the upper scrotum, was incised and the testis found high up in the canal. The testis, half the size of its fellow, was well-formed except that the epididymis was ill-developed, and had a well-marked mesentery. Palpation and inspection failed to demonstrate a vas in connection with the testis. High up behind and adherent to the posterior wall of the sac a vas of normal size was found emerging from the internal ring. The vas was coiled, and tapered away to a small nodule measuring one-quarter by one-half of an inch, which on section proved to be the epididymis. The nodule was adherent to the sac wall and had no connection with the testis.

A radical operation was performed, and the testis was placed in the upper scrotum.

Non-union of the vas with the testis is scarcely mentioned in text-books on surgery, and references are few, but the condition is probably less rare than the scantiness of the literature would appear to indicate. Among those who have described this abnormality is A. C. Wood, from whose article the following extracts have been taken:

The undescended testis, in addition to its under-development, fails to acquire its usual relation to surrounding structures. The epididymis is not closely attached to the body of the gland, but is separated by a definite space.

The mesentery, common to the testis and epididymis, which normally is short and fixes these parts closely to the peritoneum, becomes elongated, forming a pedicle.

The testis and vas develop independently. The former, with the vasa efferentia and coni vasculosi (globus major), originates in the genital ridge on the mesial side of the Wolffian body, and the latter, with the globus minor, is derived from the Wolffian duct, which is situated on the outer border of the Wolffian body. The duct is originally closed at both ends, but, as growth continues, the testis and vas are joined by the development of intermediate tubes. When the cloaca divides into bladder and rectum, the lower end of the Wolffian duct becomes connected with the prostatic urethra through the ejaculatory duct.

The origins of the testis and vas being distinct, arrest of development may affect either or both.

Of six cases of retained testis dissected by Wood, five showed failure of union between the vas and the testis, and in one of these the vas stopped short of the prostatic urethra.

When aspiration of the globus major with a hypodermic syringe demonstrates the presence of spermatozoa, Wood suggests an anastomosis between the vas and the globus major, employing the technique devised by Dr. Edward Martin in cases of sterility following epididymitis.

TUMORS OF THE MOUTH.

In a collected review by BLAIR (*Surgery, Gynecology and Obstetrics*, February, 1916) it is stated that the majority of tumors occurring about the mouth are epithelial, and in after life with few exceptions these are malignant.

Carcinoma of the mouth is usually of the squamous, prickle-celled variety arising from the mucous membrane, though adeno-

carcinoma may arise from related glands, and basal-cell tumors do occur.

Carcinoma of the mucous membrane develops much more frequently in men than in women, in the proportion of about twelve or fifteen to one. It is a disease of the latter half of life, but has occurred in children. Pond cites a case of epithelioma of the palate in a boy of sixteen, and Hochenegg one in a child of six years.

The majority of all cases can be traced to leucoplakia or some local irritation, and syphilis is supposed to be a strong predisposing factor. The general spread of syphilis and the use of tobacco in Europe toward the end of the middle ages are credited with producing a sudden increase in the occurrence of cancer of the mouth. Like cancer elsewhere, its frequency is still increasing.

Some of these precancerous lesions exist for years, some for a few months. The actual cancers themselves as a rule are rather indolent at first; and the indolent stage may exist for a long time, even years; this is especially true of cancers of the lip. A smaller number show rapid growth from the first, and the lymph-nodes have been known to become infected within three weeks after the appearance of the primary lesion.

A peculiarity of the disease in this location is that though it always will in time infect the lymphatics of the neck and in some instances very early, in but one per cent of cases does it cause distant or general metastases. Even when the neck glands are extensively involved, it is often curable, and apparent fixation of these nodes does not necessarily mean that they are inoperable, as it is only late that they become fixed to the spine and the carotid artery. Removal of all the structures of one side, with the exception of the internal and common carotid arteries, is not incompatible with life. In an old person with sclerotic arteries, tying the common or internal carotid arteries is equivalent to a death warrant.

The virulence of cancer of the mouth varies in different locations; and as a general rule the operation becomes more serious the further back in the mouth the growth occurs.

With perfected technique, radical excision with or without the use of the actual cautery is the one means that holds out promise for advanced cancer; and from very poor beginnings this method has now reached a stage of substantial achievement and with far greater promise for the future. The two causes of poor results are incomplete operation and late treatment. It is difficult to conceive of more radical operations than are now being practiced, but in regard to the average time at which the disease is brought to treatment, there is much room for improvement. That this unfortunate state of affairs is through educational efforts being radically improved will be shown in the study of the history of statistics of cancer in various parts of the mouth. From these it would seem not improbable that at no distant time the percentage of cures for cancer of the mouth, with the possible exception of those arising in the upper jaw, will be higher than in any other part of the body.

Cancer of the tongue, like cancer arising in other parts of the mucous membrane of the mouth, is almost without exception of the squamous type; but two reported cases of columnar epitheliomata arising in the tongue came to the author's notice. Seventy-five per cent or more arise in some previously existing lesion, most commonly a leucoplakia. The belief that leucoplakia is a syphilitic lesion is constantly growing, and some later writers state that the proper treatment of syphilis will go far in the elimination of cancer of the tongue.

The importance of alcohol, spices, and tobacco as primary etiological factors is less apparent than formerly believed; but these, as well as mechanical irritation, are still to be reckoned with.

The age of the patient is usually between forty and sixty years, and the predisposition increases with age; but 30 cases are recorded in patients below thirty years, 8 in males and 22 in females; and on the whole the disease is much more common

in men, the average being about 85 per cent. This latter fact has been accepted as one evidence of the rôle of tobacco as a factor, but it has been shown by von Winiwarter that the Oriental women who smoke are not more subject to it than non-smoking women of the Occident.

Of the precancerous or very early cancers of the tongue Butlin cites the following five conditions as the most characteristic and important: "(1) A little plaque-like, hard sore, smooth and polished, but neither ulcerated nor excoriated. (2) The transformation or replacement of a simple ulcer by a cancerous ulcer, which only differs from the simple ulcer by feeling a very little stiffer and a very little firmer. (3) The transformation of an entire plaque of leucoplakia into a plaque of cancer. The difference is marked by very slight thickening, a denser white, furrowing and fissuring in various directions, but without excoriation or ulceration. (4) The transformation of one small area of a leucoplakia tongue into cancer, only marked at first by very slight and superficial hardening. (5) A white. warty growth or a compound wart, neither broken nor ulcerated, and feeling at first as if it were fixed to the mucous membrane, and quite superficial." The most frequent form is the papilloma, especially one growing in a previously existing leucoplakia; the most infrequent is a submucous nodule.

Bloodgood has recently made the following suggestions:

That heretofore the tongue removals have been too extensive.

That leaving the floor of the mouth intact predisposes to recurrence.

That the removal should be done with the actual cautery.

That leaving the jaw-bone on the affected side after the removal of the floor adds to the operative mortality.

These premises have not all had the support of the most experienced.

Almost all writers have warned against not removing sufficient intra-oral tissue, most recurrences being in the mouth, and Lenthal Chealle has demonstrated cancer-cells in the muscles of the tongue far beyond the apparent site of invasion. Butlin, however, was more conservative of the mouth tissues than most others, and cites that 102 out of 200 of his cases either died of recurrence at some other site or remained alive and well for three years without mouth recurrence; and in 33 of these local recurrences the disease was so extensive at the time of operation as to preclude wider excision. This still leaves 65 out of 98 cases that had local recurrence in which a more extensive local operation might possibly have saved some.

The necessity for the removal of the floor of the mouth in all cases is answered by Butlin in the negative, he stating that he had already done this, and that in only two of his cases could it have been reasonably supposed that recurrence was due to the disease in the tissues that were left between the primary mouth operation and the neck dissection. In some of the Kocher-Langenbeck operations the floor, the intra-oral growth, and the neck glands are removed in one piece.

Butlin has been the strongest opponent to the use of the cautery, believing that hard scars predispose to cancer. Kocher has always favored cutting with the actual cautery, and this is the oldest form of operation.

As to the question concerning leaving the jaw on the affected side increasing the operative mortality, almost all series of operated cases have hitherto shown that removal of a part of the jaw increases the postoperative mortality about 300 per cent over the intra-oral operation. In support of his contention, Bloodgood states that he has operated upon 14 cases in the past five years by his newer methods without a postoperative death and only one recurrence, the latter in a secondary case—a striking record—and if borne out by a larger series over a longer period will leave no doubt of the correctness of his ideas.

Untreated cancer of the tongue ordinarily will survive a little over a year. The results of operation have been variously estimated, but with the exception of the

last series from Johns Hopkins, Butlin's results are by far the best. In 168 traced cases 33.92 per cent survived for periods varying from three to twenty-two years, with an operative death-rate in all cases of 10 per cent. In the latter half of his whole series his percentage of cures rose to 41.55 per cent. The more recent Johns Hopkins series show 50 per cent cures, but the number of cases is very much smaller and the reviewer could not make out upon just what basis this 50 per cent cures for the past five years is figured. Many series show results far inferior to these, the main determining factor being the age of the cancer when treatment is instituted. There is reason to hope that in a few years the percentage of cures will be nearer to 100 than 50 per cent, and this will be due to education rather than to operating technique.

In cancer of the lip the disease may be dormant in the lymph-nodes for years after the primary sore is cured, and then become active.

Local excisions are still being practiced, though this is largely through ignorance of the more recently established facts, but in spite of this the results of local operation for early growths are extremely good.

A lesion may exist for a few months to years before it becomes microscopically malignant, but any wart as large as the tip of the index-finger is almost certainly malignant. The history of every case of fully developed cancer of the lip reveals the fact that at some period during its presence it presented characteristics that were identical with lesions known to be benign, and therefore Bloodgood concludes that there was a precancerous stage in each, a time when it was a purely local disease.

It occurs in increasing ratio from twenty years on, but may occur before. Fifty-five to sixty years is the favorite age, and as a rule the younger the patient the more malignant the growth. It is much more frequent on the lower lip than on the upper. On the lower lip the proportion of prickle or cubocellular cancers to the basal-cell cancers is between fifty and seventy-five to one; on the upper lip it is three to one. Its occurrence is six times as frequent laterally as in the midline; 90 per cent are in men, and it is rare in the negro. Very rarely the skin surrounding develops a cancerous eczema.

The block excision of all lymph-bearing tissue of one or both sides of the neck is needed only exceptionally. As a rule the removal of one or several groups of glands, as the submental, submaxillary, and upper deep cervicals of the affected side, is sufficient. In advanced cases the most radical operation may be insufficient. The submucous lymph streams are not supposed to cross the midline, while the cutaneous ones do. This has been taken as a basis in deciding as to whether the lymph-nodes of one or both sides are to be removed. If the growth involves the angle of the mouth the buccal group should be removed.

About the throat, nose, and its sinuses, where ciliated epithelium is found, this variety is first replaced by squamous epithelium before it shows recognized signs of malignancy. Basal-cell carcinoma may develop in the antrum; it may be presumed that it is rare. Unless due to an extension from the lips or cheeks, carcinoma of the jaw is almost exclusively a disease of elderly persons. It can arise only from epithelium, and in most instances comes primarily from the mucous covering of the gums or the lining of the antrum.

Broadly, there are two clinical types of carcinoma of the jaws: the hard, ulcerating type, which usually appears on the lower jaw; and the soft, medullary carcinoma, which is found in the antrum and upon the oral surface of the upper jaw.

The malignancy of medullary carcinoma when at all advanced is always evident from the rapidity and impartiality with which it invades all tissue with the exception of the teeth and eyeball.

The prognosis of carcinoma of the body or surface of the maxilla is usually considered to be very bad.

The treatment is free excision of the primary growth, and if this is on the alveolar surface of the upper jaw or on the lower jaw, excision of all of the lymph-

nodes of that side or both sides of the neck. The plan of excision of the primary growth should correspond to its location and extent. Carcinoma invades all tissues, and the excision should be planned to include all tissues to the extent of 1.5 to 2 cm. beyond the visible margin of the growth.

Cancer of the cheek remains localized longer than cancer of the tongue or floor of the mouth, but tends early to involve the intermaxillary fold. For ulcerated carcinoma of the lower jaw which has apparently not invaded the tooth sockets, it may be well, all things considered, to retain 5 mm. of the lower border of the body of the jaw.

Many writers in their descriptions of epulis follow the literal meaning of the term and include any tumor appearing upon the gums. The most succinct and intelligent description is in a recent paper by Ivy, who describes it as a circumscribed connective-tissue growth from the alveolar ridge covered with normal mucous membrane, except in so far as the latter may undergo secondary ulceration due to pressure necrosis, infection, etc. It may be confounded with papilloma, epithelioma, etc. There are hard and soft epuli. The hard epulis is slow growing; it may be years before increase in size is perceptible; it has a sharp line of demarcation, arises from the surface of the gum, and is slightly darker in color than the normal mucosa. It is a pure fibroma, occasionally myxomatous, and may contain bone. The soft form is usually of rapid growth, arises from the interior of the bone, is dusky-red, and may be partially covered by a shell of bone. *X*-ray may show the bone clearly eroded. These tumors belong to the giant-cell or myeloma type and may contain bone or cartilage.

Confusion has arisen from describing the growth under different names and from describing entirely different growths under epulis. Giant cells are strong presumptive evidence of non-malignancy even if the tissue appears to be sarcoma.

Tumors of evident endothelial origin with giant cells scattered within the vessels are believed by Whitman and Ivy to be another and malignant group of giant-cell tumors. The unfortunate term sarcoma has led to needless resections. Kühner refers to 90 cases of epulis in the Tübingen clinic; the majority occurred between ten and forty years, and two-thirds were in women. Of 79 patients whose tumors were removed in the past thirty-five years, 72 were permanently cured, two died from recurrence, and five others were cured by a secondary operation.

The most interesting of the salivary gland tumors is the so-called "mixed tumor," which is most common in the parotid, appears in the submaxillary gland, rarely in the sublingual and lacrimal glands, in the palate, lips, and tonsils. It occurs about nine times more frequently in the parotid than in the submaxillary glands. Sturgis, quoting Wood, found that in 59 cases of mixed tumors, four were in the lip, two in the pharynx, two in the neck, one in the cheek, and one in the palate.

These tumors may be congenital or may appear late in life, but they most often develop between the ages of fifteen and thirty years and have a peculiar preference for the right side. They may arise within the substance of the gland or may be connected with it by a stalk, but they are supposed to always arise within the gland capsule. Parotid tumors may arise in front of the gland in the cheek, in the line of the mouth slit. Until they acquire or show malignant character, they are encapsulated, and at this time, unless situated very deep in the parotid, are easily removed. The gland may be found compressed and wrapped around a large tumor. When not malignant they are always sharply defined, but may be very lobulated. At first they are usually firm, but later may be cystic. In the submaxillary gland they usually grow toward the neck, but in the parotid the direction of their growth will depend somewhat upon their original starting-point; a deep tumor may grow toward the pharynx. After malignancy once becomes evident they infiltrate rapidly and may ulcerate through the skin. When malignancy develops complete extirpation should be prac-

ticed, including the lymph-nodes. The parotid gland cannot be completely removed without at least partial resection of the ramus. When the growth has gone beyond the capsule of the gland there is little hope of cure.

A report of the work carried out at the Radium Institute, London, from January 1 to December 1, 1914, shows that epitheliomata of the buccal, lingual, and pharyngeal mucous membranes are usually refractory, but the new method of burying a radium tube within the nodule has given encouraging results in cancer of the tongue. The best results in sarcoma are those of the tonsil and postnasal space. The results in nevi are good if blanching is accomplished with little pressure, while rodent ulcer is the disease which gives the best response to radium treatment.

Abbe says that radium is the only remedy for leucoplakia and a specific for giant-cell sarcoma, while Pfahler believes the best results are given by a combined treatment of excision or electrothermic coagulation together with Roentgen therapy.

Morson gives the effects of radium irradiation as follows:

Rapid degeneration of malignant cells near the radium tube.

Apparent enlargement of the cell nuclei beyond the degeneration area.

Loss of the reproduction function of the cancer-cells. Thrombosis occurs, which cuts off the supply of blood to the tumor. In a few cases decrease in the size of the gland metastases was noticed.

That radium promotes instead of checking cancer is the conclusion forced upon Rovsing by the tragic experience of whipping small indolent growths into rapid malignancy. He says his failure is not due to faulty technique, as the applications were made according to the approved methods in vogue at Heidelberg. He gives citations of cases. Czerny and Kaan found increased malignancy of tumors of the mucous membrane of the cheek after radium treatment; Wickham and De Grais had similar results.

Lazarus's experience in the radium treatment of malignant tumors was based on 600 cases. Even the inoperable tumors of the pharynx which are difficult of access sometimes showed marked improvement after this treatment, while tumors of the mucous membrane of the cheeks, and especially tumors of the mucous membrane of the mouth, are refractory.

Even the advantage of radium in combination with excision is not an unequivocal practice on account of the suspicion that has arisen that the use of the rays may accelerate rather than retard the proliferation of remaining cells after incomplete removal.

BULLET WOUNDS OF PERIPHERAL NERVE TRUNKS.

LYLE (*Surgery, Gynecology and Obstetrics,* February, 1916) summarizes an article on this subject as follows:

Primary nerve suture is rarely indicated in war time.

Unrelieved, overstretched muscular tissue leads to fatty degeneration and consequent loss of contractility.

A paralytic deformity with shortened muscle and limited joint movement, in the majority of cases, is the result of ignorance or neglect.

It is imperative, whether the nerve is divided or not, that the paralyzed muscles be relaxed and protected from strain by a suitable apparatus. Under no circumstances must this be deferred to the so-called after-treatment.

The postural prophylaxis begins with the reception of the wound and continues after the operation until voluntary motion is restored.

SUPPURATIVE PERICARDITIS.

RHODES (*Annals of Surgery,* December, 1915) observes that the pathology and symptomatology present very interesting features. There are two distinct sinuses in the pericardial sac—one, the larger, lying to the right of the large vessels at the base of the heart, and the other, a smaller one, situated along the right posterior edge of the sac, corresponding to the sternal angle

of the fifth intercostal space. In beginning exudates these sinuses fill first, and hold roughly 200 Cc. Even this amount of fluid can push the heart forward against the sternum. A small amount of pus in the pericardium can give no symptoms, aside from its constitutional evidences and the increased leucocyte count, and can be diagnosed with certainty only by the *x*-ray. This constitutes the first stage of the lesion, and one, unfortunately, very seldom diagnosed.

A second stage is instituted with the increase of the exudate up to the limits of elasticity of the sac. This stage is the ordinarily observed stage of physical signs. When, however, the limit of elasticity of the sac is overstepped by the amount of exudate, a third stage is seen, to which Rehn has given the name of Herzdruck. Rose calls it Herztamponade. It is produced by the intrapericardial pressure exceeding the intra-auricular pressure. In the slowly developing form of Herzdruck the symptoms are very striking. The patient is cyanotic, evidently in great respiratory embarrassment, even orthopneic in extreme cases. Pain in the left arm is a common symptom. There is precordial pain, increased by expiration, with a feeling of oppression in the chest. Edema of the upper thorax and one or both arms is often seen, aside from thrombosis. Some cases have shown slight rigidity and pain in the upper abdomen, usually on the left side. The veins of the neck are distended and the pulse is rapid and small. A very prominent symptom in the author's case, as in the cases of v. Eiselsberg and Harrigan, in which the intrapericardial tension was high, was great irregularity of the pulse. In very few of the cases is this found, and it would seem to be more dependent on great distention of the sac than on inflammatory irritation of the pericardium, as has been claimed by Heitler. The author's reason for this view was the instantaneous return of the pulse to normal frequency on opening the pericardium in his own case and the slower return in Harrigan's case after removal to the ward. Of course the mere withdrawal of fluid will not immediately relieve an inflammatory irritation, and if arrhythmia is to be explained as a result of pericardial inflammation, why do not the majority of cases of pericarditis show it?

The increase in the exudate pushes the heart forward, so that in the greater number of cases the heart was found to occupy a position directly against the anterior chest wall. Rehn, Brentano, Curschmann, and Schaposchnikoff hold that this is always the case, while Eichel contends that it is not always in contact, and even may occupy a posterior position. A study of the reported cases in which the position of the heart is mentioned shows that in four the heart is said to be anteriorly placed, and in two cases, those of Sibley (operated on by Mr. Lane) and Harrigan, it lay deep in the thorax, while Eichel reports that all his cases, as did the author's, had fluid between the heart and the anterior pericardium. However, the exceptions must not blind our eyes to the important fact that the heart is usually held anteriorly by the exudate.

Among the rarer symptoms Blechmann has called attention to the genu-pectoral position assumed by some patients. Hertz claims this to be pathognomonic, and of course due to the effort to relieve the large vessels of the backward pressure of the heart and exudate.

In the *x*-ray we possess a most valuable aid in diagnosis, especially in the early cases, and in children. In adults care must be exercised to avoid error in diagnosis, for in some of the early cases the radiograms have closely simulated those of aneurism of the first portion of the aorta. Purulent mediastinitis also presents a similar picture. No obscure chest condition presenting a high leucocyte count should be allowed to escape the *x*-ray, for in that direction may lie our sole opportunity to make an early diagnosis, while the fluid is still in the pericardial sinuses.

The combination of these special symptoms with the well-known physical signs of fluid in the pericardium and a high leucocytosis is sufficient to make the diagnosis. The leucocyte count runs high, 20,000 to 38,000, and it is well to remember that an

associated empyema or pneumonia may complicate both the leucocytosis and the physical signs. The liver is very often pushed downward, especially in large effusions, sometimes a handbreadth below the free margin of the ribs. In one case the diagnosis of liver abscess was entertained.

Aspiration of the pericardium, for treatment or diagnosis, must be most emphatically condemned. Fevrier has collected nine cases from the literature which were treated solely by aspiration with a mortality of 100 per cent, not a very encouraging percentage, even when compared with the high percentage following operation.

Mintz's method of operative attack is the latest addition to the already numerous avenues of approach to the pericardium. This method was proposed by him in 1903. As described by him it consists in an incision along the under border of the seventh costal cartilage. A skin and cartilage flap is now made, and opened from above downward. Access is now permissible to the extrapleural space, in which the pericardium can be opened without danger of injury to the pleura.

All the described methods have as their object the incision and thorough drainage of the pericardium. Certain lessons can be learned by study of the case reports. The exudate should not be allowed to escape too rapidly from the pericardium, for too rapid lowering of the intrapericardial pressure may result in sudden "still stand" of the heart, as occurred in Harrigan's case. It might even be advisable to aspirate the pericardium before incising it. If no exudate is observed anteriorly examine behind the heart, as it may be pocketed there. The sinuses must be thoroughly explored.

Free drainage must be maintained. The continuous action of the heart tends to force out the softer drainage materials, such as rubber tissue, while the experience of Tartarinow (quoted by Kolb) shows the danger of the rubber tube, which caused necrosis of the heart wall by pressure. V. Eiselsberg advocates stitching the pericardial sac to the muscle layer, while Gussenbauer sews it to the skin margin. This when possible should be done, as the incision tends to close very rapidly, but where there is extensive edema of the soft tissues, whether from anterior mediastinitis or from Herzdruck, as in Eliot's case and in the author's, it is impossible. Drainage of some description must be used, as a considerable portion of the fatal cases show no provision was made for permanent drainage. Fear of necrosis in the writer's case led him to discard the rubber tube in favor of rubber tissue, which was passed at each dressing into both sinuses of the sac with dressing forceps after irrigating the sac with salt solution. This method of drainage proved amply sufficient, as the post-mortem showed, although the daily irrigation and replacing of the drains was very painful.

THE ABDOMINAL SKIN-FLAP IN RADICAL AMPUTATION OF THE BREAST.

ELSBERG (*Annals of Surgery*, December, 1915) notes that in the last two years he has operated on patients with malignant disease of the breast who had metastases in the skin of the chest wall below the breast, so that the radical removal of the disease required a wide-spread excision of skin and subcutaneous tissue. The large defect that remained could not have been closed by any of the plastic methods ordinarily used, and skin-grafting would have been necessary had not the raw surface been covered over by means of a large flap of skin from the abdominal wall.

The skin of the abdominal wall is generally very lax and receives abundant blood supply from branches of the arteries which run through the wall of the abdomen from behind forward. If the base of the skin-flap is not too small the tissues will be well nourished with blood, and there is no danger of sloughing or of marginal skin necrosis. After the flap has been raised from fascia and slid upward into the new position, there is no difficulty in closing the defect in the abdominal wall with interrupted sutures. It is surprising how much skin can be used for the flap and sufficient remain to close up the defect in the abdominal parietes without

much tension. Size and shape of the abdominal skin-flap will depend upon size and form of the raw surface on the chest wall.

The abdominal skin-flap is necessary only in those cases in which the defect left after radical amputation of the breast cannot be closed by any of the methods ordinarily in vogue; it is useful after extensive removal of skin, and makes skin-grafting unnecessary.

PERFORATING WOUNDS OF THE ABDOMEN.

MEYER and TAYLOR (*Lancet*, Jan. 1, 1916) note that the usual symptoms and signs of intraperitoneal lesions, such as pain, tenderness, rigidity, and vomiting, are generally markedly prominent in gunshot cases. Entire absence of rigidity where a perforation of the gut is certainly present is observed in moribund cases only. In their experience at least one case was lost where the peritoneum was found to be intact and the track of the bullet was entirely extraperitoneal, yet the bowel had been perforated; under similar circumstances they would now open the peritoneum. Chloroform followed by ether was used routinely. Subcutaneous salines were given under the breast. In the 50 cases operated upon small perforations were sutured; larger wounds and multiple rents or perforations lying very closely together, endangering the vitality of the operative area, were resected. The peritoneal cavity was rapidly but carefully mopped and drainage was instituted for from twenty-four to forty-eight hours. In the after-treatment, half a cubic centimeter of pituitrin was given the second or third day, and at the same time two ounces of glycerin were injected into the rectum, and repeated the following day if necessary. In their experience the action of pituitrin is of inestimable value in promoting intestinal peristalsis. About the fifth day an enema was generally given, except where the pelvic colon had been sutured. Regurgitant vomiting was treated by stomach lavage, repeated as often as necessary. Out of the series of 50 cases there were 17 deaths. The usual cause of death was primary hemorrhage combined with the element of shock always present. Next in order of prominence was general peritonitis, which takes from about forty-eight hours onward to bring about a fatal issue. A few cases seemed to die from pure shock.

Of the 50 cases operated upon, 17 died. There were 41 cases not operated upon during the same period, either because the patients were moribund or because no perforation was suspected, or because conservative treatment was considered advisable. Of these seventeen died. Of the cases deliberately treated conservatively not a single case died, although bullets had traversed the peritoneal cavity quite obviously in a number of these. The indications for conservative treatment were the general appearance of the patient, absence of shock, the condition of the pulse, the state of the abdomen, and the course of the bullet.

RECENT WORK IN RADIUM, RADIOLOGY, AND ELECTROTHERAPEUTICS.

FINZI (*The Practitioner*, February, 1916) quotes Dachtler on the postoperative prophylactic treatment of carcinoma of the breast. Before commencing the investigation, he visited many institutions to study the technique employed and the results obtained. He found that whenever unfavorable opinions of the treatment were given, almost invariably on investigation, faulty methods of technique were discovered. Dachtler's cases, which were treated more than five years ago, number 29; of 16 of these which did not show macroscopic involvement of the axillary glands, 13 were still alive, after over five to eight years, while the other three died of intercurrent disease (in two of these no sign of recurrence was found, while the third died of endothelioma of the brain and showed no recurrence of the original carcinoma). Of the 13 cases with marked axillary involvement, nine died within six months after the operation; all but one of these were free from any local recurrence. The other four lived varying times up to five years, and

got no recurrence. He notes that some patients had recurrence on the opposite side of the chest, while the treated side remained free.

Treatment was given every day for the first fortnight, with an anode distance of 12 inches, and through a leather filter. After a fortnight's interval daily treatments were again given, until 30 or 40 had been administered, 35 being the average number. If too severe a reaction occurred, treatment was discontinued for one or two weeks. A deep tanning of the skin was produced. He does not recommend any subsequent treatment.

Dr. Levin presents a most fair-minded review of the relation between the surgical treatment and the radiotherapy of cancer. After examining the statistics, he comes to the conclusion that rather less than 30 per cent of cancer patients can hope to be cured by surgery alone. If radiotherapy should change the figure only to 35 per cent, the method of treatment is more than justified. Radiotherapy acts by virtue of its selective action, the injury caused by the rays to the cells of the growth being greater than that caused to healthy tissues. He advocates a combination of surgical treatment with radiotherapy. With regard to technique he employed 50 mg. of radium bromide screened by 0.5 mm. of silver and generally 0.75 mm. of brass in addition, paper and india-rubber being also used to cut off the secondary rays. For extensive growths this amount is applied for twelve hours every other night until 100 hours have been consumed, and then, if necessary, another shorter course after four weeks. *X*-rays are used in a method like that of Krönig and Gauss, except that fewer and larger ports of entry are employed. Three millimeters of aluminum are used as a filter. At the time of writing his experiments with the Coolidge tube were not far enough advanced for publication.

Arcelin has an important paper on the difficult and intangible subject of late *x*-ray effects, of which he has collected eight cases, in two of which, however, the only effect after the conclusion of all *x*-ray treatment seems to have been the development of telangiectases. He does not distinguish between cases treated by filtered and unfiltered rays, but a study of his cases bears out Speder's contention that late reactions only occur when filtered rays have been used, unless the unfiltered dose has been sufficient to produce a burn. Arcelin points out that these late effects are more likely to develop when large areas have been treated. He shows that when a patient has been treated with *x*-rays, and received a large dose, a subsequent treatment, after an interval of a year or more, with similar doses, may sometimes provoke a dermatitis, whereas none had previously developed. He follows Nogier and Regaud in the belief that the use of thicker filters (3 to 4 mm. of aluminum) will prevent the occurrence of these reactions.

GUNSHOT WOUNDS OF THE ABDOMINAL CAVITY.

HAYS (*Surgery, Gynecology and Obstetrics,* February, 1916) records eighteen cases of gunshot wounds of the abdominal cavity. Of these only 13 had perforation of the hollow viscera with 7 recoveries, giving a recovery percentage of 53.84. Five cases did not have any injury to any part of the intestines. Of this number four recovered.

The greatest number of perforations in any one case was 16. The time of operation after injury in those cases which recovered was from two to twelve hours. In those cases in which death occurred, the time of operation after injury was from seven to fifty-seven hours. The average time of operating after injury in those who recovered was about five or six hours; for those who died the average time was about seventeen hours.

Symptoms of gunshot wound of the abdominal cavity are quite frank and vary but little: rigidity of the abdominal muscles, tenderness of the abdomen to pressure, and the wound of entrance. Distention of the abdomen is usually late. Dulness may be present from hemorrhage. Treatment is entirely operative, which should be early.

POLLUTIONS IN THE MALE.

Under this engaging title HUHNER (*New York Medical Journal*, Feb. 5, 1916) states that boys approaching adolescence should be told of the probability of the occurrence of wet dreams from time to time, so that they may not be frightened at their appearance and run to the first advertising quack they hear about. It seems to be the opinion among young adults that the appearance of a pollution is a sign that their sexual organs are ripe and demand their exercise in coitus. This opinion should be carefully warned against.

Every effort should be made to bring up the young man with as pure thoughts as possible, and to keep him away from suggestive literature and plays. It were well if he would abstain from alcoholics, especially beer, for these stimulate the sexual centers as well as the genitals themselves. He should take as little tea and coffee as possible. Cold bathing in the morning should be encouraged, but hot baths should be taken as little as possible, especially at night. He should empty his bladder before retiring, and arise as soon as he awakens, so as to diminish, as much as possible, the morning erection, which leads to erotic thoughts.

Normal men should be told in plain and definite language the significance of pollutions, their harmlessness if not too frequent, and the measures advocated in the prophylactic treatment just mentioned should be enforced if possible.

In patients suffering from pathological pollutions, the measures just advocated under prophylaxis must be enforced. There is little use in treating these patients, if they will not abstain from alcoholics, tea, coffee, and all kinds of sexual excitement. Spooning is especially to be interdicted.

The first thing to be done is to stop the pollutions. Nothing succeeds so well here as the bromides in large doses—fifteen grains of sodium bromide three or four times a day, well diluted, after meals. The primary effect is really remarkable; patients with three or four pollutions a week quickly drop to one in one or two weeks. The psychic effect of this rapid diminution in the pollutions is also well marked. As the pollutions decrease in numbers, the bromides should be given less and less often, until only at bedtime, and finally should be stopped altogether.

At the same time we must relieve the congestion or other pathological condition in the posterior urethra. For this purpose Huhner has tried various expedients, but has found the instillation of weak silver solution through the Bangs sound syringe to be the best of all. Very strong cauterization of the verumontanum, as recommended by some German authorities, he has found to be of no use whatever.

Nor has he found the psychrophore of much use in these conditions, but must admit that he has not tried it often enough to give a final opinion. According to German authorities, it must be employed every other day from five to twenty minutes at a time. Now, in private practice, he has not been able to induce patients to come every other day when suffering from no other condition than pollutions, and in the author's dispensary class it takes entirely too much time to give a large number of patients twenty minutes each, every other day, for a long period. In the few dispensary cases in which he has conscientiously given it a trial, however, he has obtained no good results; but, as stated above, the experiments have been entirely too few to warrant a decisive opinion. Even the German authorities, who have large experience with this method, say that some cases are made worse by it, and that they cannot tell beforehand whether it will benefit or harm in any particular case. They also concede that even in cases in which it does good, temporary impotence often follows.

In defecation and urinary spermatorrhea, the bromides do not act as quickly or as positively as in the other forms. On the theory (which has not been proved) that the condition is due to a weakness of the sphincters of the ejaculatory ducts and of the seminal vesicles, as well as to a weakness of the musculature of the seminal

vesicles, the author has tried strychnine in small and large doses, but without result. The main treatment in these cases is to avoid constipation, the accumulation of hard fecal masses, by proper catharsis, and the treatment of the prostatic urethra as above indicated.

In urethrorrhea it is only necessary to instruct the patients about the harmfulness of spooning, and their discontinuance of such and similar sexual excitements will generally bring about a cure. If necessary, a few silver nitrate instillations in both the anterior and posterior urethra will usually cure the patient.

TREATMENT OF CONGENITAL SYPHILIS.

SCHALEK (*Urologic and Cutaneous Review,* January, 1916) in the treatment of the pregnant mother insists on the intensive use of mercurial injections, the iodides, and the intravenous administration of salvarsan. It is wiser, if the treatment is begun during the early months of pregnancy, to employ the small doses of salvarsan, 0.2 to 0.3 to 0.4 gramme, rather than the full dose, although it has been shown that salvarsan does not seem to increase the tendency to abortion or hemorrhage. The total amount of the drug given should be at least 1.5 grammes, and larger amounts are safer.

A normal placenta does not allow arsenic to penetrate. The syphilitic placenta does. Findlay and Robertson report that in no case was the course of the pregnancy interrupted by such treatment. The mothers felt better rather than worse. It has been found that in the case of every syphilitic child the spirochæta travels along the umbilical cord and infects the fetus. Of 128 women with latent lues, who were treated with mercury and iodides, 88 per cent living children clinically well resulted, the remainder showing signs of the disease. The effect of mercury, unless long continued, is fleeting.

Fournier reports the case of a syphilitic woman pregnant eleven times. She had no treatment whatsoever during the first seven pregnancies. She had seven still-births. During the eighth and ninth pregnancies energetic mercurial treatment was given. Two healthy children were born. No treatment was taken during the tenth pregnancy and the child was born dead. In the eleventh pregnancy treatment was taken, and the woman brought forth a healthy child.

When salvarsan is combined with mercurial therapy remarkable results are obtained, Sauvage reporting 93 per cent and Bourret and Fabre 100 per cent cures. These latter statistics may be found somewhat enthusiastic, for it must be admitted that many cases showing congenital syphilis after reaching six to twenty years of age have shown no manifestations of the disease during the first few years of life.

In the apparently healthy child with negative Wassermann and negative luetin, from parents known to have active syphilis, it is well to treat this child with mercury. For the injection of salvarsan in children the jugular vein has been employed, and likewise the veins of the scalp, but whereas these routes are excellent in the case of neosalvarsan, where highly concentrated solutions can be used and the operation quickly finished, it is difficult to keep the child quiet enough for a sufficiently long period of time to permit the steady flow of 50 to 100 Cc. as is the case when old salvarsan is used. The first dose of the arsenic preparation should be a small one. Neosalvarsan has a wider field of usefulness in congenital syphilis than in the acquired form because it can be given in high concentration. The veins of the scalp should be chosen in infants up to two years. The initial dose can be diluted with 3 or 4 Cc. of saline or freshly distilled water in the ordinary Record or Luer syringe. Slight reactions occur at times.

Mercury is as available in the treatment of inherited syphilis as salvarsan. The intramuscular injection is not desirable in infants because of the delicacy of their tissues and the readiness with which they perish. Inunctions should be given six days out of the week. In very small children and infants bichloride baths are satisfactory. Twenty or thirty grains of bichloride mixed with an equal quantity of ammonium

chloride should be used. Oral medication is not satisfactory. The iodides should never be given without mercury or salvarsan; they do not cure syphilis. Destruction is accomplished by mercury and arsenic. Iodides sweep away the waste matter. Three deaths have been recorded incident to involvement of the cardiovascular system during the acute stages of the disease. There is the widest daily variation in the strength of the Wassermann dependent upon no known factor. The pathology of syphilitic conditions of the kidneys centers about the vascular structures in the kidney substance. In chronic nephritis the albumin may disappear following salvarsan and iodides. Patients are known not to have had albumin for three or more years.

NEISSERIAN PROCTORRHEA.

MAPES, of Louisville, under this title (*Urologic and Cutaneous Review*, January, 1916) quotes Baer to the effect that rectal gonorrhea is found in nearly 40 per cent of all cases of gonorrhea in women. Schmidt records 21.6 per cent of rectal involvement in gonorrhea. In no case was the discharge of pus noted from the anus. The mucosa was red and bled easily. The changes were most marked in the sphincteric region. It is believed by Bacon that employing for enemata the same syringe and nozzle previously utilized for vaginal douching is more often than otherwise responsible for infection of the rectal mucosa and the development of Neisserian proctorrhea.

Berndt reports eighteen cases of rectal stricture due to Neisserian infection. Stenosis usually occurs one to four inches from the anus, but may extend to the sigmoid flexure. The treatment consists in regulating the bowels, employing antiseptic douches, and in dilating the stricture with bougies.

Mapes believes that Neisserian proctorrhea in the male is much more common than is suspected by the profession. Treatment consists in regulating the bowels, in employing antiseptic douches, in dilating the stricture with bougies which should be left *in situ* as long as circumstances will permit, in maintaining the feces soft, healing the ulcers, and destroying the infective agent.

REVIEWS.

PULMONARY TUBERCULOSIS. By Maurice Fishberg, M.D. Illustrated. Lea & Febiger, Philadelphia, 1916. Price $5.00.

The purpose of this book is to supply the general practitioner with information concerning the etiology, diagnosis, prognosis, and treatment of pulmonary tuberculosis, its clinical forms and common complications. The author, therefore, has a large field to cover, and we can truthfully say he has covered it well.

Naturally our greatest interest is in that portion of the text which is devoted to treatment. This covers, very properly, almost two hundred pages, out of the 627 that make up the volume, and is divided into fourteen chapters, beginning with Indications for Treatment, considering the General Management of the Case, Climatotherapy, Institutional Treatment, Drug Treatment, etc.

We are surprised to find that the author says nothing of the value of camphoric acid in controlling the night sweats of phthisis, and also surprised that he advises the use of alcohol in some form to prevent the sweating. It has been our experience that the use of whisky or brandy, by dilating the peripheral capillaries, has a tendency to increase sweating. We should think that the use of a 3-per-cent lysol solution to sponge the surface of the body, because of its disagreeable odor, would tend to nauseate the patient.

The sections which are devoted to hemoptysis are competent and interesting.

We note with interest that the author has confidence in the use of carbolic acid and creosote in this disease, and also that he thinks that gelsemium combined with cannabis indica is a safe anodyne. We would

have supposed that the former drug was too depressing.

There is no doubt that a good summarization of our knowledge of tuberculosis is needed at this time, and the general practitioner will find Dr. Fishberg's book a useful one, as it is essentially the book of a clinician rather than that of the laboratory investigator. The various problems of tuberculosis with which the laboratory investigator is chiefly concerned are, as one would expect, not sufficiently fully discussed in this volume to make the book popular with this class of workers.

REPORT OF THE FIRST EXHIBITION TO SOUTH AMERICA IN 1913. By Harvard School of Tropical Medicine. Harvard University Press, Cambridge, 1915.

It is not often that a group of medical men have it in their power to present, not only to their professional colleagues but to the scientific world in general, so valuable a contribution to medicine and science as is this handsome volume of 220 pages, which is illustrated with beautiful colored plates, as well as with black-and-white figures. The members of the expedition were Dr. Richard P. Strong, Professor of Tropical Medicine, Harvard University Medical School; Ernest E. Tyzzer, Assistant Professor of Pathology; Charles T. Brues, Assistant Professor of Economic Entomology; A. W. Sellards, Associate in Tropical Medicine; and J. C. Gastiaburu, Director Municipal Laboratory of Hygiene, Lima.

The book is divided into nine parts. It opens with a general introduction to the programme of the expedition, then gives a careful survey of Oroya Fever and Verruga Peruviana. These two diseases take up by far the greater part of the volume. Their discussion is copiously illustrated. The authors have been able to prove that these diseases are not only not identical, and that they are not representations of a first and second stage of one malady, but that they are entirely different infections. Every possible aspect of this interesting and important subject has been examined into. In this country, where these two diseases practically are never seen, these studies have not the practical importance that they have in South America, where these diseases are prevalent and induce a high mortality.

Those of us who are unable to add so materially to the sum of human knowledge and who also are prevented from carrying out studies which in their results tend to diminish a vast amount of suffering cannot but look with envy upon the opportunities which these investigators have been enabled to embrace, neither can we read their report without being thrilled with admiration for the splendid quality of their work and the excellent way in which they have made their report.

THE BASIS OF SYMPTOMS. The Principles of Clinical Pathology. By Dr. Rudolph Krehl. Authorized Translation from the 7th German Edition by Arthur Frederic Beifeld, Ph.B., M.D. With an Introduction by A. W. Hewlett, M.D. Third American Edition. Price $5.00.

It will be recalled that the first two American editions of this book were prepared by Dr. Hewlett, who now writes the introduction to the third American edition. The present issue deals more thoroughly than was possible in its predecessors with the noteworthy advances which have been made in medical science, with particular reference to the subject of Cardiac Arrythmias, Leukæmia and Pseudoleukæmia, and such phases of infection and immunity as Anaphylaxis, Complement Fixation, Chemotherapy, the Phenomena of Gastric Secretion and Motility, Renal Functional Tests, and Glands of Internal Secretion, Gout and Diabetes. A new chapter has been introduced on Constitutional Diseases and Diatheses.

Like most German works, comparatively little attention is paid to American contributions, but Dr. Beifeld, exercising his editorial prerogative, has inserted many notes which show how much Americans have done in medical science within the last decade.

The book is, as its title indicates, one

upon clinical pathology, but the object of its text is to show the relationship between clinical pathology and symptomatology; it, therefore, in many instances goes further and describes briefly functions of normal organs b e f o r e discussing pathological changes in function. Throughout the text emphasis is laid upon certain sentences and parts of sentences by printing them in large type. This does not make a particularly good-looking page, but it is useful to the student and ordinary reader. Copious bibliographies are attached to important chapters.

The book is a valuable one for the active practitioner and can be studied and read with much advantage by the undergraduate, who, by its pages, will learn to correlate symptoms and pathological changes in function and tissue.

ENDEMIC DISEASES OF THE SOUTHERN STATES. By William H. Deaderick, M.D., and Loyd Thompson, M.D. The W. B. Saunders Company, Philadelphia, 1916. Price $5.00.

Dr. Deaderick is already well known to the medical profession by reason of valuable contributions which he has made on the subject of malarial infection. With Dr. Thompson, he now presents us with a book dealing with the Endemic Diseases of the Southern States. Although the authors fully recognize that many of these diseases are widely disseminated throughout the Northern States, the fact that they are most prevalent in the southern tier of States leads to their inclusion in this volume. The eight chapters upon Malaria are contributed by Dr. Deaderick, as are also the eight which are devoted to Blackwater Fever. The eight chapters upon Pellagra and the eight upon Amebic Dysentery are written by Dr. Thompson and Dr. Deaderick. Those upon Hookworm Disease, eight in number, are by Dr. Deaderick. The closing chapter deals with Other Intestinal Parasites than the Hookworm and is by the senior author. The book is needlessly large because it is printed on heavy paper with wide spacing between the lines, but the good size type with which it is printed makes its reading easy and enjoyable. A careful description of the measures which should be taken to prevent the spread of these diseases which are transmissible is given, and definite directions are added as to the treatment which the authors think will prove most successful. It is an interesting contribution to an important subject and doubtless will be widely read and heartily approved of by all physicians, who frequently come in contact with the maladies which are discussed.

THE DESCRIPTION OF AN OPHTHALMOSCOPE. Being an English Translation of Von Helmholtz's "Beschreibung Eines Augenspiegels" (Berlin, 1851). By Thomas Hall Shastid, A.B., A.M., M.D., LL.D., F.A.C.S., Superior, Wis. Chicago: Cleveland Press, 1916.

More than sixty years have elapsed since Helmholtz published his description of "An Ophthalmoscope for the Investigation of the Retina in the Living Eye," but for the first time there appears in our language a translation of the Helmholtz monograph by Dr. Shastid, who is to be congratulated upon the accuracy and clearness with which he has rendered into English the paragraphs of this classical, indeed, one may say this immortal, essay. The profession is deeply in Dr. Shastid's debt for many articles on the history of ophthalmology and biographical sketches of the great masters of this science and art, and now he has added to these obligations by publishing the translation to which this notice makes reference. Surely each student of medicine, and especially each student of ophthalmic medicine, will desire to possess and to read this treatise, which, to quote its opening paragraph, "contains the description of an optical instrument by which it is possible in the living eye to see and recognize exactly the retina itself and the images of luminous objects which are cast upon it." This instrument thus introduced revolutionized the study of ophthalmology, and was the means of calling into existence the science of medical ophthalmoscopy. The value of the monograph has been enhanced by a number of interesting foot-notes written by the translator. G. E. de S.

SOCIAL TRAVESTIES AND WHAT THEY COST. By D. T. Atkinson, M.D. Vail-Ballou Company, New York, 1916.

This book deals in an interesting way with one of the great problems of all times. It contains nine chapters, the titles of which are as follows: Conventional Prudery and its Results, The Price We Pay for Ignorance, Innocence the Burden Bearer, The Relation of Social Diseases to Environment, Potent Reasons for Harmful Social Conditions, Unwholesome Social Standards and Disease, The Ounce of Prevention, The Franchise for Women and its Relation to Social Reform, and The Promise of Economic Responsiveness. The author recognizes the difficulty of the problem; he also is fully cognizant of the injustice meted out to those suffering as a result of the social evil, and he lays particular emphasis upon the importance of ignorance in its constancy and dissemination.

THE MEDICAL CLINICS OF CHICAGO. January, 1916, Vol. I, No. 4, and March, 1916, Vol. I, No. 5. The W. B. Saunders Company, Philadelphia, 1916. Price per year, paper $8.00, cloth $12.00.

The Medical Clinics of Chicago are supposed to be stenographic reports of clinical lectures delivered by various members of the staff of each of the large Chicago hospitals. For this reason they cover all of the problems which are met with in the medical service of general hospitals, and the views expressed are those of men of large experience in hospital and private practice. In some instances instruction is given in the form of questions and answers; in others the reports are in the ordinary stenographic style.

THE PRACTITIONER'S MEDICAL DICTIONARY. By George M. Gould, A.M., M.D. Third Edition, Revised and Enlarged, by R. J. E. Scott, B.C.L., M.D. P. Blakiston's Son & Co., Philadelphia, 1916. Price $2.75.

Dictionaries prepared by Dr. Gould have been before the profession for the last twenty-five years, varying from the very large illustrated dictionary of Medicine, Biology and Allied Sciences with its supplement including 38,000 additional words, to a small pocket pronouncing dictionary which sells for about one-tenth of the price. We now have presented to us a product half-way between these two extremes, the object being to provide a modern dictionary for physicians and medical students that would be up to date, contain all the words that are needed, and still be issued in a form convenient to handle, and published at a low price. This has resulted in resetting the type throughout, eliminating much that is old, and in including much that is new. The present edition contains about 71,000 terms and, although it contains 962 pages, weighs only 2½ pounds. It is bound in flexible binding, cloth and leather, with round corners, is only 1¼ inches thick and 8¾ inches high. It is a model of book-making both from the standpoint of the author, the editor, and that of the publishers.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles. Edited by H. R. M. Landis, M.D. Volume I, Twenty-sixth Series. J. B. Lippincott Company, Philadelphia, 1916.

If we mistake not, this is the first issue of International Clinics under the editorial charge of Dr. Landis, who brings to his new duties enthusiasm, literary ability, and editorial training. The present issue deals with subjects in Therapeutics, Medicine, Neurology, Public Health, Pathology, Gynæcology, and Surgery, and is illustrated with numerous black-and-white and colored plates. The volume closes with a General Review of Medicine for the Year 1915, by Frank A. Craig and John Speese.

ELEMENTARY BACTERIOLOGY AND PROTOZOOLOGY. For the Use of Nurses. By Herbert Fox, M.D. Second Edition, Revised and Enlarged. Freely Illustrated. Lea & Febiger, Philadelphia, 1916.

Dr. Fox is well known as one who is thoroughly qualified to prepare an excellent text-book upon this subject for medical students and practitioners as well as laboratory men. When so easy a task is set him as the preparation of text to give nurses information along these lines, it can readily be imagined that he has found no difficulty in making his text not only useful but accurate. The colored plates are unusually

good, not only in execution but also because they show what the legend underneath them describes. The book is too elementary for the medical man, but can be heartily recommended to those in charge of training schools for nurses who feel that information along these lines should be had by the pupils who are receiving their instruction in hospitals.

THE PRACTICAL MEDICINE SERIES. Volume One, General Medicine. Edited by Frank Billings, M.S., M.D. Series 1916. The Year Book Publishers, Chicago, 1916. Price $1.50.

This small volume of 375 closely printed pages resembles its predecessors in previous years and affords a summarization of medical literature during the past twelve months, prepared under the supervision of a master clinician. The text is in the nature of abstracts rather than in the form of a story. Whenever it is necessary illustrations or plates are inserted.

AUTOPLASTIC BONE SURGERY. By Charles Davison, M.D., and Franklin D. Smith, M.D. Illustrated. Lea & Febiger, Philadelphia and New York, 1916.

This is an excellent combination of laboratory and clinical work, showing a wide knowledge of the literature bearing on the subject and a wise discrimination of the logical deductions to be derived therefrom. There is a brief description of the development, anatomy, and histology of the periosteum, with surgical applications of this knowledge. Chapters follow on the Generation of Bone, The Indications for Autoplastic Bone Surgery; Instruments, Technic, and Transplant; the Autoplastic Repair of Recent and Ununited Fractures, with further applications of the method of living bone-grafts. An excellent book and always convincing, giving a broad review of a subject concerning which no surgeon should be ignorant.

VENEREAL DISEASES. A Manual for Students and Practitioners. By James R. Hayden, M.D., F.A.C.S. Fourth Edition, Thoroughly Revised. Illustrated. Lea & Febiger, Philadelphia and New York, 1916.

This fourth edition of Hayden's book, essentially practical, represents an admirable condensation of existing knowledge upon the subjects covered. It constitutes a handbook on the treatment of gonorrhea and its complications, chancroid and syphilis. It is interesting to note that the specificity of Ducre's bacillus is not admitted and cauterization is not urged as an early treatment. The illustrations are excellent and truly illuminating to the text. There is a good practical discussion of salvarsan as against neosalvarsan. The question of technique is covered well throughout. This is a most serviceable handbook.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

There does not appear to be any medical news of great interest. It is really remarkable what little discomfort we are suffering from lack of drugs when formerly the supply of most of these came from Germany. Occasionally in these days one is able to pick up interesting bits of information from patients. The other day I had to examine for insurance purposes a manufacturing chemist. I learned from him that we are now making many chemical products which it was not worth our while to make previously. With enhanced prices, this particular individual was very pleased with himself and his results, and further seemed quite confident that he could continue after the war to compete on the old prices. We have recently been asked to avoid using acetone as much as possible. All the acetone is being taken presumably for munition manufacture. This drug has in the last few years been used largely by the surgeons in preliminary purification of the skin, and as a solvent for iodine and other substances.

It is no hardship to return to the old days of turpentine and strong mixture, and I daresay the results will not suffer detriment.

Medical cases being returned from Flanders are much the same as formerly, and call for no comment. One point is, however, constantly being brought to my notice—the frequency with which quiescent tubercle is lighted up in the lungs. Most of the cases show evidence of this by hemoptysis, pleurisy, or continued cough. The disease oftens lights up within a few weeks of joining and before strict training has been entered upon. I do not think it is the fault of the medical examiner of recruits that these cases are accepted. In only one instance have I been able to elicit the fact that the previous infection had been mentioned at the physical examination. All the other men admitted to not having mentioned it—the majority to having concealed the fact of a previous indication of pulmonary disease. The inevitable delay in getting these cases invalided out is unfortunate, and does not militate toward cutting short the recrudescence.

The recruiting authorities are now getting much more particular as to the physical condition of recruits than formerly. Three months ago a private practitioner who wrote a certificate for an obvious defect found that the certificate was disregarded, and the recruit taken. At the present time with a certificate given in a very mild form and pointing out some slight deficiency, the recruit returns with a note on his paper "obviously defective."

The enrolment of the medical profession is gradually proceeding. The position at present is that all the single men up to forty are enrolled, or if not will be so in the next few days. They are in the position of the single men not belonging to the medical profession, and are liable to compulsory service. The married men under forty-one in the medical profession are in a similar position to the married men outside the profession—attestation is not compulsory, and as enrolment is the equivalent of attestation, it is at present optional. The general opinion is that attestation of the married men up to forty will be made compulsory by act of Parliament shortly. In this event the married medico will be advised to enroll. We are expecting some definite statement from the Premier as to the calling up of the married men on his return from France at the end of this month.

The position of the doctor forty-one to forty-five years of age is anomalous. He is over the age of compulsory military service for those outside the medical profession, but is asked to enroll whether married or single. The Director-General of the Medical Services has stated that the military age for medical men does not stop at forty, but extends to forty-five. As far as can be gathered, enrolment has gone fairly well in Scotland and the country districts of England, but not so well in the large towns, and especially in London. As this may be due to a certain amount of want of confidence in the Central Medical War Committee, which is more likely to be felt in London than elsewhere, a further advisory committee formed of Fellows of the Royal Colleges of Physicians and Surgeons has been established, which will act as a consultative body working through the Central Medical War Committee. The first duty of this new body will be to institute a complete survey of the metropolitan hospitals and medical schools to determine the minimum necessities of these institutions, and so obviate the risk of serious depletion of staffs, etc. Following this they will deal with cases affecting these institutions, especially in respect of individual members of the residential and teaching staffs—*i.e.*, as to whether such is indispensable or not, or would suffer excessive hardship of personal nature if required to enter the R. A. M. C.

Any case may be referred to this body by the Central Tribunal under the Military Service Act or by the Central Medical War Committee.

Generally the Central Medical War Committee is accredited with the desire to get all enrolled, but the profession is a little suspicious that when calls do come the selections will not be fairly made. Also

there seems to be no indication of the Committee making any effort to see that the second duty entrusted to them is receiving attention, viz., to arrange that such men as do join shall be employed in the capacity for which they are best fitted.

After the South African war, in the general clearing up and reorganizing, a committee was formed to act as an advisory and consultative body in relation to the Medical Department of the War Office. It consisted of several eminent and practical physicians and surgeons.

This committee has never been called together since war began, although instituted with the express object of meeting such a position as has now arisen. This has given rise to much comment and some speculation.

It is not often that one has the opportunity of seeing and talking to a returned prisoner from Germany. I saw such a man the other day. He had been paralyzed from the waist down, probably by a hemorrhage round the spinal cord. From this he was recovering and was almost completely well again. Apart from his physical condition he was interesting as being willing to tell of his treatment as a prisoner. I have always been inclined to doubt the truth of many of the allegations of maltreatment. In this patient's case I had first-hand evidence. Personally he had certainly suffered from very marked neglect and some cruelty both moral and physical, and related some experiences of his own comrades, which he had witnessed, which clearly show that the cruelties and inhumanities are not understated. Most of these acts took place before the first visit of the American Ambassador and his colleagues. The prisoners were very much better treated thereafter, and are extremely grateful for the improvement which followed. It is interesting to get confirmation of general reports by means of such an interview.

THE PHENOL TREATMENT OF CARBUNCLE AND HEMORRHOIDS.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: As a practitioner who has treated carbuncles with pure carbolic acid for 27 years and hemorrhoids for 22 years, I feel justified in expressing an opinion based on a large clinical experience concerning the efficiency of this method of curing these two troublesome and at times dangerous conditions. As to the carbuncles when they have already ulcerated there is no need for further operative treatment. When the skin is intact a free crucial incision should be made after a preliminary anesthesia. Through this incision or the ulcerated opening pure carbolic acid should be thoroughly applied, the raw and granulating surfaces having previously been dried. The pure phenol is held in solution by heat. Every part of the ulcer should be saturated. The skin overlying the swelling should also be painted, precautions being taken that the acid does not run over the healthy surfaces. This treatment is repeated daily for five or six days. The results are at times amazing. After five or six days there is found a healthy, healing granulating surface which goes on to rapid cicatrization, far more rapid than that which follows the use of the curette. As for dressing, a little vaselin placed on gauze and held in place by cotton-batting and a bandage is adequate.

The treatment as applied to hemorrhoids is exceedingly simple. The parts are cleansed and painted lightly with pure phenol, a 10-per-cent cocaine or novocaine solution with adrenalin having previously been applied. After being painted the tissues are coated with vaselin, which is also spread over the surrounding skin. Cotton-batting is applied over the parts and held in place by a T-binder.

ROBERT W. SKIPPER.

LOVELADY, TEXAS.

THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE.

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ORIGINAL COMMUNICATIONS.

SOME PRACTICAL POINTS ON THE TREATMENT OF ECLAMPSIA, WITH REPORT OF ILLUSTRATIVE CASES.[1]

BY J. O. ARNOLD, M.D.,

Associate Professor of Obstetrics, Temple University Medical School; Assistant Obstetrician to Samaritan Hospital.

The cause and prevention and treatment of eclampsia are among the oldest and most extensively discussed themes in the practice of medicine. Hundreds of investigators in all parts of the world have for years been working ceaselessly on these questions, with but comparatively little practical result. In fact, the whole subject of the toxemia of pregnancy, in spite of all that has been done, remains to-day the greatest unsolved problem in the obstetric world. When the time comes, as I believe it will come sooner or later, that the origin and specific rational treatment of this great scourge of maternity are definitely known, medical science will have conferred on womankind the greatest boon since the days of Semmelweis and Holmes. This peculiar and all-prevailing maternal toxemia may not cause as many deaths as sepsis, or as much mental and physical anguish as dystocia, or even as long a train of morbid sequelæ as labor traumatism, but all of these are largely, if not wholly, preventable. Their causes are known, and they only continue to exist because we permit them to, but the toxemia of pregnancy still spreads its terrors in all its varied forms, without our being able rationally and consistently to raise so much as a finger in its prevention.

But to come back to the subject of treatment. I find at the conclusion of my notes on eclampsia, written some two years or more ago, in the maternities of Vienna, Dublin, Glasgow, Edinburgh, and London, this brief summary of the impressions made upon me at that time: "A judicious combining of the Stroganoff or 'conservative' methods, with some of the best of the more radical measures, is, in my opinion, productive of better results in most cases than the attempt to follow either school alone." This was the way I felt about it then, and after two years of experience in the practical application of that idea I am more than ever convinced that the impressions then recorded were correct. That I may help you to weigh this matter for yourselves, I shall briefly outline the two methods, and then give you some case reports to show the results of a plan of treatment that includes something of both.

The methods of the so-called Continental or "conservative" school may be summarized about as follows: "No matter what causes eclampsia, it is the convulsions that kill, or do the serious damage. If they can be prevented, or quieted, nature will cure the eclampsia, or whatever produces it." This is the central idea of the Stroganoff treatment. The immediate or precipitating cause of the convulsions is some local or transient excitant. Therefore, the first object in treatment is to remove, so far as possible, every peripheral or other excitant. If the patient is in a convulsion when first seen, give her at once at least a half-grain of morphine hypodermically. If she is not in a convulsion, but has been or appears

[1] Read at a meeting of the North Branch, Philadelphia County Medical Society, Feb. 28, 1916.

to be on the verge of a seizure, then chloroform is given in the smallest possible quantity that will enable one to give, without disturbance, the first hypo of morphine, to make any examination necessary, or to do venesection if that is immediately urgent. The next step is to darken the room and secure absolute quiet, for even light and noise may excite convulsions. In about one hour 30 to 40 grains of chloral hydrate is given by the bowel. In another hour (or two hours from the first dose) the second hypo of morphine is given. Alternate doses of chloral and morphine are then kept up at such intervals and in such amounts as appear necessary to control the convulsions and quiet the patient. If in spite of this treatment convulsions continue (which they will in a certain small percentage of cases), then the uterus must be emptied.

If the convulsions are thus controlled, which it is claimed they are in a large majority of the cases, then the pregnancy is not interrupted, but allowed to go on a month, more or less, as the case may be, to delivery at term.

It will be noted that this programme leaves no place for the stomach pump, for active purgation, or for hot packs, or other methods of sweating. The only immediate means of elimination is by venesection, which is done freely, and until effective on the blood-pressure. Sweating might not be inconsistent with this programme of quiet and non-interference, but it is absolutely contraindicated, according to this school, on the ground that the toxins are already in too concentrated a form, and that sweating increases this concentration, by removing much water from the tissues, with but a negligible quantity of the toxins.

Washing out the stomach cannot be successfully accomplished, it is claimed, without greatly disturbing the patient at a time when the whole aim is to prevent all disturbances. Purging could only remove the gastrointestinal toxins and not the specific toxins of pregnancy, and would also deplete and weaken and disturb the patient, when absolute quiet is the thing sought for. Likewise any attempt to induce labor, to dilate the os, to apply forceps, or to interfere in any way with the natural process of emptying the uterus, would, according to the Stroganoff idea, be prohibited on the ground of its being a violent excitant, liable to cause convulsions, and to shock and weaken the patient.

So much for the conservative side.

In the English maternities, and very largely in American institutions, there are those who wholly or in part reject the Stroganoff methods, and maintain that since we have no rational treatment for eclampsia there is but one thing to do, and that is to terminate pregnancy as quickly as possible, and thus remove the direct or indirect source of the toxins that cause the convulsions. Accouchement forcé, therefore, including vaginal or abdominal Cæsarian section, or if not so urgent as this, some of the slower methods of opening the uterus, along with the most vigorous methods of elimination by bowel, skin, and kidneys, practically sums up the radical treatment.

I found as I traveled about that the degree of radicalism, as well as the methods of securing elimination, and of temporarily controlling the convulsions, varied greatly with men and places. For instance, Monro Kerr of Glasgow was a rather ardent advocate of accouchement forcé, and the eclampsia mortality in Glasgow maternity was very high, 30 per cent or more. Ballantyne and Nicholson of Edinburgh were enthusiastic on almost every other radical measure except the forcible emptying of the uterus, and their results were fairly good. They used hot packs, gastric lavage with huge doses of salts left in the stomach, and venesection with calcium chloride gr. x to the pint, intravenously, to take the place of the blood withdrawn.

Morrison from one of the English colonial hospitals has just reported 236 cases treated chiefly by morphine, and sodium chloride and sodium acetate 3j of each to the pint, substituted for blood withdrawn by venesection.

Tweedy and Jellett, of the Dublin Rotunda, compromised with their more radical English and Scotch brethren by letting the

pregnancy alone and using morphine freely, washing out the stomach and introducing purgatives, and giving alkaline fluids subcutaneously. At the same time they strenuously avoided chloroform, hot packs, bloodletting, and all drugs or foods by mouth, and their mortality was the lowest on record outside of the Stroganoff clinics.

So much in brief for these two schools. In the absence of any scientific or rational treatment, which of course must await the discovery of the cause, the value of these various palliative and empiric measures must appeal to us in accordance with the degree of success attending their use. When any method of treating eclampsia brings the mortality down from 20 per cent or more to 8 per cent or less, as the Stroganoff treatment has done in several of the large European maternities, even to less than 6 per cent in the hands of Stroganoff himself, then it is our duty as obstetricians to give serious consideration to such a method, and so far as possible to adapt and adopt it in our practice, for no other treatment has ever given half as low a death-rate.

If morphine and venesection and the barring of all peripheral or other excitants, including gastric lavage, violent purging, sweating, and accouchement forcé, will greatly reduce both the maternal and fetal mortality in eclampsia (which it has done wherever systematically adopted), then I for one am going to try to follow close to this course of treatment. But if in addition to this I find that the consensus of opinion among the most successful English and American obstetricians is that the uterus should be emptied whenever one or more convulsions have occurred, then I believe I am justified in departing from the strict letter of the conservative treatment to the extent that will permit me in the majority of cases, after having controlled the convulsions, to terminate pregnancy, and to terminate it by whatever method promises least shock to the patient. And finally, if Martin H. Fischer, and Tweedy, and Ballantyne, and Morrison, and many others have conclusively shown that the replacing of toxic blood withdrawn by alkali-salt solutions has greatly favored kidney action and thereby hastened the recovery of the patient, then I feel that I had good grounds, some two years ago, for further modifying the Stroganoff method, by substituting for chloral hydrate the Fischer solution with bromides.

To sum up, then, I would say that what has appealed to me as the best general plan of treatment for eclampsia at the present time is about as follows:

1. Chloroform, if necessary, in the smallest possible quantity that will enable one to give the first dose of morphine without disturbing the patient.

2. This first dose of morphine to be at least half a grain, and to be repeated in two hours, or as soon and as often as is necessary to control the convulsions.

3. Bleeding by venipuncture or venesection as early in the attack as possible, and to the extent of from 12 to 24 ounces or more, according to the case and to the effect on blood-pressure, using the blood-pressure apparatus, preferably, for the tourniquet.

4. After cleansing the lower bowel, the giving by Murphy drip of sodium bromide 3j or 3ij, and sodium carbonate 3ij or 3iij to the quart of normal salt solution, as rapidly and as constantly as the bowel will take it. If the bowel should be intolerant of this solution, or if the case appears to need it, in addition to this fluid by bowel, bicarbonate of soda 3ij to the pint of normal saline is given by hypodermoclysis, as often as appears necessary.

5. In cases occurring before the eighth month, if there have been more than two or three convulsions, induce labor. After the eighth month, terminate pregnancy regardless of the number of convulsions, letting the circumstances and conditions determine whether the delivery shall be by the normal route following the induction of labor, or by the more rapid method of Cæsarian section.

6. No drugs or nourishment of any kind (with the possible exception of water) to be given by mouth until long after the convulsions have ceased, but a continuation of the alkali-salt solution by bowel until the quantity and quality of the urine are satisfactory.

I append brief case reports of the last 17 eclampsia patients coming under my care. I am well aware that so small a number of cases is of comparatively little use in pointing the value of any method of treatment. That, however, is not my sole purpose in reporting them. I feel that the series is of some interest in this connection, in that it comes as near to covering all types of the disease, and of the various complications that go with it, as one is likely to find in so small a number of cases. It also suggests how one's eclampsia mortality may be high or low from causes largely independent of any method of treatment.

The list is made up of 14 primiparæ and three multiparæ. There were five maternal deaths—four from attacks occurring in pregnancy, and one in labor. Of the 19 babies born, seven died. Two of the seven had not reached the age of viability; one died *in utero,* possibly from preëclamptic toxemia (No. 3); and four, all premature, died from the direct effects of the eclampsia or its treatment.

I have separated the list into four groups:

(A) Three cases of preëclamptic toxemia.

(B) Eight cases of antepartum eclampsia.

(B) Four cases of intrapartum eclampsia.

(C) Three cases of postpartum eclampsia (one of these appearing twice in the list).

It will be seen that the three cases in Group 1 were unquestionably on the verge of eclamptic seizures, and were all successfully treated by bloodletting and alkali-salt solution, with rest in bed and restricted diet. No. 1 illustrates the relative value of home and hospital treatment, in controlling such conditions. No. 2 appeared to show the efficacy of blood serum from a woman in labor as a means of inducing labor in another. No. 3 may be of interest to those who hold that the intrauterine death of the child lessens the toxemia. Of the four deaths in Group 2, only one (No. 8) resulted directly from the convulsions. No. 4 died of pneumonia several days after the convulsions ceased. No. 9 had but one kidney and a late infection, and No. 10 died of intestinal obstruction (ileocecal intussusception). Death in each instance, however, was indirectly due to eclampsia, and therefore every case must be counted in reckoning the mortality-rate. In Group 3, labor had begun in each case before the convulsions occurred, and excepting No. 13, each patient responded more or less promptly to treatment. No. 15 illustrates the mistake of depending upon the postpartum flow for bleeding. This was a strong, full-blooded girl, and should have been bled 25 or 30 ounces at once, regardless of delivery.

The three postpartum cases not only show considerable variation in the time of onset, but demonstrate the value of morphine and venesection at this time, as well as in the earlier cases.

While the mortality of this list is high, yet from the standpoint of the method of treatment here recommended it is not as bad as it would at first appear. In every case in which the treatment was carried out efficiently from the start, the results were good. Nos. 8 and 13 died practically without treatment. No. 13 is of special interest. Death followed two convulsions in rapid succession, which came at the end of an exhausting labor, wholly unheralded by any of the usual signs of toxemia. In fact it may be questioned whether such an attack is due to toxemia at all, or whether it may not be due to the severe strain of labor on an overwrought nervous system, and therefore another appeal for greater care in conserving the nerve energy of this type of patients in labor.

No. 8 is worth reporting to show the futility of that half-hearted, slow, and wholly inefficient method of treatment, which is still taught in some places, and still practiced by too many physicians. With a strong, plethoric, robust young woman, as in this case, suddenly overwhelmed with the peculiar poisons of pregnancy that have filled her blood to overflowing, to waste valuable time trying to control convulsions with small doses of morphine and veratrum viride, or other drugs, or trying to eliminate these poisons through the indirect route of the bowels, kidneys, and skin, is, in my opinion, as bad as no treatment at all.

I am morally sure that this patient was not different at the outset from several other cases in this series that yielded read-

ily to treatment, and I have every reason to believe that large doses of morphine and early and copious bleeding, with alkali-salt solution in the blood, would have saved this woman, as it saved the others.

It will be seen, therefore, that of the five fatal cases, not one died under the treatment here outlined, and that the other twelve patients all recovered under this treatment.

In conclusion I would like to emphasize these points:

1. That preëclamptic toxemia should be treated as promptly and as actively as eclampsia itself.

2. That morphine in sufficient quantity is the safest and most effective agent for temporarily controlling convulsions.

3. That venesection, early and freely, is the quickest and best means for securing elimination and reducing blood-pressure.

4. That the high degree of acidosis in eclampsia calls for alkali-salt solution to replace the toxic blood withdrawn.

5. That in practically all cases, after controlling the convulsions, the second step in treatment is to empty the uterus.

(A) PREËCLAMPTIC TOXEMIA.

(1) Mrs. C., I-para, aged twenty-six. Seen in consultation at end of seventh month. Blood-pressure 210. Scanty urine, loaded with albumin. Headache, visual disturbances, and general edema.

Diagnosis: Preëclamptic toxemia.

Treatment: Removal of patient to hospital, venipuncture, alkali-salt solution by bowel, milk and water only by mouth.

Immediate and rapid improvement. More than 100 ounces of urine in the second twenty-four hours. Fischer solution gradually discontinued. Patient went home in two weeks feeling quite well. At home, toxic symptoms soon returned, and labor was induced at end of eighth month.

Child born normally and in good condition. Eclampsia on third day, postpartum. (See No. 18.)

(2) Mrs. R., I-para, aged twenty-four. Eight months pregnant. Blood-pressure 180. Scanty urine loaded with albumin. Edema, dizziness, and visual disturbances.

Diagnosis: Preëclamptic toxemia.

Treatment: Removal to hospital, venipuncture, saline purges, and restricted diet. Two days showed much improvement, but blood-pressure still 150.

On third day patient was given experimentally 15 Cc. blood serum from a non-toxic woman in the beginning of labor. Without other apparent cause, labor began in five or six hours, and terminated normally about thirty hours later. Alkali-salt solution by bowel was continued for several days. Albuminuria gradually disappeared. Mother and child made good recovery.

(3) Mrs. B., I-para, aged twenty-three. Eight months pregnant. Blood-pressure 178. Persistent severe headache and visual disturbances. Very scant urine, almost solid with albumin. Muscular twitchings of face noted at times.

Diagnosis: Preëclamptic toxemia.

Treatment: Bloodletting, which immediately relieved the headache; saline purge, followed by alkali-salt solution by Murphy drip. Much improvement in two days. Sixty-four ounces of urine in twenty-four hours. No fetal heart sounds heard. Blood-pressure still above 150. Labor induced on third day. Still-born child. Threatened convulsions during labor were quieted by morphine. Rapid improvement followed delivery. Ten days later, blood-pressure and urine were normal.

(B) ANTEPARTUM ECLAMPSIA.

(4) Mrs. F., I-para, aged nineteen. Eight months pregnant. First seen in consultation after she had had ten convulsions. Patient unconscious, with convulsions recurring about every half-hour. Morphine given without much effect. Blood-pressure was reduced by venesection, and labor induced. Patient delivered of a dead child four hours later. Convulsions continued during labor, and for a time afterward—more than twenty in all. General condition of patient very bad. Response to alkali-salt solution poor. Some improvement in the next two days, followed by bronchial pneumonia and death one week later. No necropsy.

(5) Mrs. G., I-para, aged twenty-four. About 8½ months pregnant. Seen in consultation as she was emerging from her third convulsion. Gave at once morphine grain

½ and drew 20 ounces of blood. No recurrence of convulsions. Morphine repeated in one hour and alkali-salt solution given by Murphy drip. Patient improved rapidly, and three days later went into labor spontaneously and was successfully delivered of a living child. Mother and babe made good recovery.

(6) Mrs. F., I-para, aged twenty-two. About 8½ months pregnant. Seen in consultation after she had had two convulsions. Gave morphine and did venesection. No more convulsions. Diagnosis of twins. Labor induced by use of an "A" tube. Labor long and rather severe, but patient stood it well. Mother and babes made good recovery.

(7) Mrs. M., I-para, aged twenty-eight. Seven months pregnant. Seen in consultation a few hours before her eclamptic seizure. Blood-pressure 190. Severe headache and dimness of vision. Scanty urine, loaded with albumin. Patient taken at once to hospital, and 20 ounces of blood drawn. Alkali-salt and bromide solution started by bowel. The first convulsion occurred about an hour later. Half-grain doses of morphine were given as often as convulsions occurred, which was at three- to four-hour intervals. Induction of labor resulted in the birth of a dead child twelve hours later. Patient had five convulsions before emptying the uterus, and one five hours after. Improvement was rapid and recovery complete.

(8) Mrs. K., I-para, aged twenty-four; 8½ months pregnant. Seen in consultation after she had been in severe convulsions for ten hours. Convulsions were recurring every half-hour, and patient had been unconscious from time of first convulsion. She had been given small doses of morphine, chloroform, purgatives, pilocarpine, and hot packs. Her condition was extremely bad. No evidence of life in child. Rapid delivery by vaginal hysterotomy with craniotomy failed to give relief. Convulsions continued, and patient died from exhaustion shortly after delivery.

(9) Mrs. J., I-para, aged nineteen. Six months pregnant. Came under my care at the Samaritan Hospital, after three or four convulsions had occurred. Patient unconscious; convulsions unusually severe, and recurring at half-hour intervals. Morphine and bloodletting controlled the convulsions, after there had been six or seven in all. Labor was induced and a dead fetus expelled about six hours later. Much improvement in twenty-four hours, but only 3 or 4 ounces of urine. Patient regained consciousness, but was at times delirious. Alkali-salt solution and all other efforts failed to increase the quantity of urine. General edema became marked and delirium constant. On the third day patient began to have fever, which ranged from 101° to 104° for the next three days. Death occurred on the sixth day.

Necropsy revealed one functioning kidney, and one rudimentary kidney congenitally located in front of the body of the last lumbar vertebra. The pathologist also reported a general infection of the pelvic and abdominal viscera with the bacillus aerogenes capsulatus.

(10) Mrs. M., multipara, aged thirty-four. About 6½ months pregnant.

Admitted to the Samaritan Hospital in the service of Dr. J. C. Applegate, with whose permission I report the case. In Dr. Applegate's absence she came under my care, after she had had five convulsions. She had thus far failed to respond to treatment, and was in extremely bad condition. High-tension pulse, marked cyanosis, and beginning edema of the lungs. Morphine and venesection quickly relieved the respiratory distress, and she had but one more convulsion. Considerable improvement in the next twenty-four hours. At this time the uterus expelled a macerated fetus. There was also noted at this time marked distention of the abdomen, which grew gradually worse in the next two days and resisted all efforts to secure bowel action or give relief. The diagnosis of intestinal obstruction was not confirmed by a surgeon called in consultation. Death occurred one week from date of admission to hospital. Necropsy revealed a complete obstruction of the bowel from ileocecal intussusception.

(11) Mrs. C., VI-para, aged forty-two. About seven months pregnant. Had four

convulsions at home. Her physician gave morphine and did venipuncture, then sent her to the Samaritan Hospital. When seen in consultation, patient was very restless and still having convulsions at one-hour intervals. She was again bled and given larger doses of morphine. Only one convulsion after this. Induction of labor resulted in the expulsion of a dead child six hours later. Alkali-salt solution with bromides was given by Murphy drip. In twenty-four hours patient had cleared mentally and was in good condition. Complete and rapid recovery.

(C) INTRAPARTUM ECLAMPSIA.

(12) Mrs. E., I-para, aged twenty-three. At term. Labor had been in progress but an hour or two when patient had an eclamptic seizure. Saw her in consultation after her second convulsion. Examination revealed twin pregnancy, marked general edema, scanty urine loaded with albumin, but blood-pressure below 150. Letting 12 ounces of blood brought blood-pressure to normal. In the next twelve hours patient received two half-grain doses of morphine and two quarts of Fischer solution with bromides by bowel. In this time she had three convulsions at three-hour intervals, regaining consciousness after each fit. One breech presented and labor progressed slowly, but patient's condition improved rapidly, and labor ended in the birth of living children thirty-six hours later.

(13) Mrs. S., I-para, aged thirty-three. At term. Had been under my care for three months. Throughout pregnancy her general physical condition was poor. None of the usual evidences of toxemia, but a low vitality and unstable nervous equilibrium requiring almost constant medical attention. There was also a history of acute dilatation of the heart some years before. Labor began spontaneously, and progressed slowly but normally except for a severe pain on the top of the head, which grew less severe as the os bcame more fully dilated. After ten hours dilatation was complete, the head well engaged, and to conserve her failing strength I prepared to terminate labor with forceps. When just ready to apply the instruments the patient was unexpectedly seized with a most violent convulsion. A small quantity of chloroform was given as soon as possible, and I quickly delivered the child, alive and uninjured. A second convulsion immediately followed delivery, and the patient died within a few minutes from heart exhaustion.

(14) Mrs. M., I-para, aged twenty-two. At term. Symptoms of toxemia had been noted for about a week. Normal labor had continued six hours when patient had her first convulsion. Saw her in consultation immediately after this, and under morphine and light ether anesthesia terminated labor with forceps. A second convulsion occurred half an hour later. Morphine was again given and alkali-salt solution by bowel. Within an hour patient had her third and last convulsion. Mother and child made a good recovery.

(15) Miss S., I-para, aged twenty-one. At term. In labor several hours when convulsions began. Admitted to Samaritan Hospital, where she came under my care, in the absence of Dr. Applegate, with whose permission I report her case. Labor terminated normally shortly after her admission. Severe convulsions were occurring about every half-hour, and continued postpartum. Morphine was given and 15 ounces of blood taken by venesection immediately after delivery. Convulsions became less severe, but continued at long intervals for the next twenty-four hours. In this time alkali-salt solution with bromides was not well tolerated, but the bowels had been well moved by purgatives. On the third day convulsions returned in great severity and frequent intervals. She was given ¾-grain doses of morphine at one-hour intervals and was again bled about 20 ounces and given an equal amount of alkali-salt solution hypodermically. Only two convulsions after this—more than 20 in all. Mother and babe made good recovery.

(D) POSTPARTUM ECLAMPSIA.

(16) Mrs. H., I-para, aged twenty-three. At term. Marked toxic symptoms noted for one week prior to labor. Spontaneous labor resulted in the birth of a small but healthy child. About twenty-four hours

later she had her first convulsion. In the next two hours three more convulsions occurred. After consultation she was given morphine, and was bled till blood-pressure fell to near normal. No more convulsions. Alkali-salt solution by bowel was kept up until urine became normal. Patient made a rapid recovery.

(17) Mrs. M., multipara, aged thirty-six. Delivered in normal easy labor at term. A large, strong woman who had not appeared toxic before labor. Began to have convulsions eighteen hours after delivery. Saw her in consultation as she was coming out of her third attack. Did venesection, 20 ounces, and gave three half-grain doses of morphine. No recurrence of convulsions. Alkali-salt solution was given by bowel. Rapid and complete recovery.

(18) Same as Case 1. Mrs. C., I-para, aged twenty-six. Eight months pregnant. Labor induced on account of persistent toxemia. Convulsions on the third day postpartum—five in all. Convulsions controlled by morphine and venesection and alkali-salt solution. Complete recovery of mother and child.

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ANESTHESIA IN LABOR.[1]

BY WILLIAM R. NICHOLSON, A.B., M.D., PHILADELPHIA.

The better title to my contribution to this symposium would have been "Analgesia During Labor," since—and this I desire to make clear—I am only concerned with the conduct of normal deliveries by means of analgesia. This is the larger part of the question in any event, since the time is long past when fruitful debate could be had as to the necessity of anesthesia in the major obstetric operations.

However, it was not so long ago—about the middle of the last century—that there was a most acrimonious debate in progress in this city between two very prominent obstetricians relative to the use of anesthetics in labor, the one gentleman strongly advocating such use, while the other, on the grounds of morality and religion, denied the propriety of their administration. Since that time we have progressed, and the "newer obstetrics" of our day has devoted much attention to the lessening of the pains of parturition. To such an extent has our enthusiasm carried us that, in our attempts to minimize the suffering of parturition, we have at times taken unjustifiable chances with respect to the maternal life, the fetal life, or both.

Now while it goes without saying that it is the duty as well as the privilege of the physician to lessen pain wherever possible, it is nevertheless clear that in combating the one evil we must not create a greater. While all present-day obstetricians are enthusiastic advocates of anesthesia, it is well to preserve our sense of proportion in our attempt to determine the best method by asking a question before going further, namely: Is anesthesia really necessary in normal labor? The whole past history of the world proves that it is not, provided that the patient as well as the labor be normal, but, as Lusk said thirty years ago, it is to be remembered that the price of our increasing civilization is a decrease in the power of resistance, and that the necessity of guarding woman against excessive suffering is becoming more and more important. To put it in another way, I would estimate that probably 15 per cent of normal women in normal labor really need anesthesia from the medical standpoint in order to be able to accomplish their task satisfactorily—*i.e.*, not merely to accomplish delivery successfully, but to do so without evil after-effects. The remaining 85 per cent will be delivered as safely and as satisfactorily, as regards evil after-effects, without anesthesia as with it. Now this is important, since in our advocacy of anesthesia to combat a type of pain manifestly not beyond endurance, the obstetrician accepts more than the usual responsibility inherent in the choice of an anesthetic. If this statement is agreed to,

[1]Read as part of a symposium on "Newer Obstetrics" before the Philadelphia County Medical Society at its meeting in February, 1916.

and it is certainly self-evident, its remembrance will help in the elucidation of the problem before us, namely, the selection of an anesthetic for use in labor which is not only efficacious but also safe for mother and child.

There are four possible methods by which we may induce analgesia in labor: chloroform, ether, scopolamine with morphine, or some one of the derivatives of the latter, and finally nitrous oxide with oxygen or air.

Chloroform is the easiest of all anesthetics to administer, is always efficacious, and would be ideal except for the fact that its danger is so great that it should never be used even as an analgesic agent. I have in former years used it repeatedly, but the margin between the required and the toxic dose is too narrow for safety, it is eliminated slowly, and its secondary or late results are more serious than those of any other anesthetic agent. In general surgery it has an estimated death-rate of from 1 in 1000 to 1 in 3000.

Ether is the safest of all anesthetic agents. It has a death-rate of from 1 in 5000 to 1 in 10,000. Of course, both the death-rate given for ether and also for chloroform are based upon statistics obtained from those who are at least moderately skilful in the administration of these drugs. If all deaths for which either of these drugs were responsible in unskilful hands could be computed the story would be a very different one.

I take this opportunity to express my sincere appreciation of the work done by the Bureau of Medical Education and Licensure of Pennsylvania in compelling the employment of skilled anesthetists in hospitals. I am free to admit that real experience in the giving of anesthetics is impracticable during undergraduate days, but at least some attempt could be made to teach the dangers incident to anesthesia and the symptoms which show that the said dangers are imminent. We have as a profession been remiss in this matter; it has been largely corrected now by the action of the Bureau of Medical Education, but it would have been corrected long ago had the public been informed as to actual conditions.

The use of ether as an analgesic in labor has been quite satisfactory, and it will continue to be the method of choice by the large number of practitioners because of its cheapness and ease of administration.

SCOPOLAMINE-MORPHINE-NARCOPHEN-PANTOPON.

In considering this anesthetic there are two points which I wish to place clearly before you: first, that there is no possible doubt that it is perfectly feasible to completely anesthetize a patient by these drugs; and secondly, that when we speak of this method of obstetric analgesia we are considering an entity, namely, the Gauss or Freiburg procedure. I desire to emphasize that the Freiburg method is an entity, since more than one enthusiastic searcher after dollars rather than after scientific truth has exhibited a single dose of morphine with one or two doses of scopolamine, and then has laid down claim to being a follower of the Freiburg school. The whole technique must be carried out, namely, hospital care, quiet, darkened room, noiseless attendants, dark glasses, and ears stopped with cotton. Any other plan of exhibition is not fair to the originators of the method, to say nothing of the lay journals and the department stores, whose altruistic activities were so much in evidence a few months ago.

Now what do we know as to the efficacy of this method? First of all it is to be remembered that for complete or surgical anesthesia a combination of these drugs has been conclusively shown to be very dangerous, more so than chloroform. The general surgeons had proven this to their satisfaction, and most of them had ceased to use it before we embraced it. Leaving this aside, we can now speak with considerable knowledge as to its efficacy as an amnesic agent in labor, and I shall quote from Polak, he being one of the most careful investigators of the question from the scientific standpoint. He has studied four hundred cases of labor conducted by this method, and reports an entire absence of maternal and fetal mortality. He has seen no cases of postpartum hemorrhage, and asphyxia neonatorum was less than usual. In his

series were eleven cardiovascular patients, two cases of exophthalmic goitre, six cases of pulmonary tuberculosis, eight eclamptics, and twenty-two border-line cases of pelvic contraction, to whom he desired to give the full test of labor. He cannot therefore be charged with having arbitrarily selected his cases. He states that from 70 to 80 per cent of cases will experience amnesia, and that the first stage is always eased and shortened in primiparæ. Further, he finds that the cervix is promptly dilated, and claims among the greatest advantages of the method that its use affords time for the maternal forces to obtain complete cervical dilatation, thus allowing the head to be driven deep into the pelvis, even though there be some relative disproportion; as a practical proof of this he notes a great reduction of median forceps operations in his clinic. He concludes that it is especially applicable to the nervously unfit woman, that it diminishes the number of forceps operations, that it is valuable in border-line contraction cases, and finally that it is essentially a first-stage procedure and bears the same relation to the first as does chloroform, etc., to the second stage. This last conclusion contains the gist of the whole matter and will be referred to later.

Another investigator, however, tells a totally different story. Baer reports a series of sixty cases with no success in twenty-six cases, little success in seven cases, partial success in eight cases, fair success in five cases, good success in eight cases, and complete success in six cases. This series may be criticized because of its small size, since it is well known that to have success in this method the operator must be able to individualize his patients, and this takes large experience. Nevertheless it may be at least noted that Baer reports prolongation of labor, increased fetal asphyxia, thirst, severe headache, very difficult control of patients, and also great difficulty in the observance of aseptic technique, due to the mental state of many of the patients. He also reports an increased number of cases of postpartum hemorrhage. In this series delirium was noted in a considerable number of the patients.

Now let it be remembered that the so-called "twilight sleep" was offered as a panacea for the pains of childbirth, and that when its advocates pleaded its cause a year or so ago we heard nothing as to the necessity for any other anesthetic during the whole course of labor. Not only the aforesaid popular magazines and department stores, but even members of the profession under the influence of Germanic "cultur" assured us that the hypodermic was woman's best friend, and that the conscious suffering of childbirth was a thing of the past. What the present attitude of the lay press and the "delivery departments" of certain large stores may be I know not, but the enthusiastic professional advocates of two years ago have relegated this method to its proper position, namely, as an adjuvant to the first stage. Here there is no doubt of its value, particularly if divested, as no doubt it will be, of its nonsensical trappings. In a word, the benefit which we have received from the popularization of "twilight sleep" is the realization that small doses of scopolamine, combined with one dose of morphine, may be of greater value than morphine alone in highly neurotic women during the first stage of labor, but that as a means to secure a painless delivery it is both non-efficient and dangerous, the danger being due to the impossibility of individualizing patients, together with the uncertainty of the action of the drugs and also their relatively slow elimination, which can in no way be hastened. Even had we no better means at our command by which to accomplish our end, I believe that scopolamine-morphine would have soon joined the large collection in the "lumber-room" of medicine. Fortunately, however, we have a therapeutic resource which bids fair to accomplish all the unfulfilled promises of "twilight."

The anesthetic properties of nitrous oxide were discovered by Sir Humphrey Davy in 1800, eighteen years before the discovery of ether and forty-seven years before Flourens demonstrated the anesthetic properties of chloroform. In 1863 Andrews suggested the use of oxygen with

nitrous oxide, and Klikowitsch of Petrograd used it in a series of twenty-five deliveries in 1880. Within the last few years much attention has been paid to this agent as an analgesic during labor. The disadvantage of this method is the relatively cumbersome and expensive apparatus which is necessary as compared to the hypodermic armamentarium of the scopolamine-morphine enthusiasts or to the bottle of chloroform or ether. Moreover it is decidedly more expensive to administer, costing at least one dollar and a half per hour. On the other hand its superiority over any other method of analgesia is so great that these real disadvantages are outweighed. After one has had a little experience in the use of the apparatus it will be found that gas oxygen is 100 per cent efficient instead of failing in from 10 to 40 per cent of cases, as does scopolamine. Again, it is more rapid in its analgesic action and much more quickly eliminated than any other anesthetic agent, thus rendering possible the most complete analgesia during the pains with complete consciousness between them. It is no more dangerous than ether, and is vastly less dangerous than chloroform or morphine-scopolamine. It is true that anesthesia to the surgical degree has resulted in death in a considerable number of cases, and I feel that the evidence compels us to consider gas oxygen as a little more dangerous than ether in deep anesthesia if both be given by competent administrators. In the hands of the ordinary hospital interne there is no question but that gas is much the more dangerous of the two, if their use as surgical anesthetics is under discussion.

The above digression is necessary to again call attention to the fact that we are only considering analgesia and not surgical anesthesia, and that as gas can only kill by asphyxia, and has a very wide margin between the dose required for analgesia and the toxic dose, it is a perfectly safe analgesic if only attention be paid to the color of the patient. It is I believe a safe anesthetic, in skilled hands, for the major obstetric operations; Webster as early as 1909 employed it in Cæsarian section, and I know it to be ideal for outlet forceps and suture introduction; but this is still aside from the question under consideration. What we are now really discussing is the relative value of nitrous oxide as compared with scopolamine-morphine as an analgesic in normal labor.

The greatest danger proposed by the opponents of gas oxygen is that asphyxia of the child will be greatly increased. From my own experience, from the experience of my friends, and from the literature, I believe that there is no more, indeed, if anything a somewhat lessened, danger of asphyxia neonatorum under gas than under ether, the degree of anesthesia being the same in each instance. This is but natural, both because of the rapidity with which the nitrous oxide is eliminated and because there is reason to believe that nitrous-oxide-oxygen anesthesia, no matter to what depth, is not due to asphyxia alone, but that there is some specific anesthetic action as in ether or chloroform. Moreover, labor is not prolonged, but really seems to be shortened. I have seen cases, in which the administration was begun in the second stage, change the character of their pains as though pituitrin had been given. During the agonal period of the perineal stage complete analgesia can be quickly secured, and yet, as soon as the child is delivered, the woman is entirely conscious and is free from the relaxation and nausea which so often accompany ether. Moreover, the uterus in gas cases has, in my experience, contracted more promptly than after any other anesthetic. This last point is of the greatest importance, since there can be no question as to the advantage of having a woman completely uninfluenced by any anesthetic from the moment of the delivery of the child until the placenta has been expelled, one of the prolific causes of post-partum hemorrhage being a more or less deep anesthesia at the time of delivery, resulting, as it frequently does, in uterine participation in the general relaxation. Nitrous-oxide-oxygen enables one to attain this desideratum perfectly, while no other anesthetic even approaches it.

Finally, when it is desired to repair a

laceration of the perineum one can insert the stitches with comfort, the patient being completely analgesic, and yet between each stitch the woman may be perfectly conscious. Three or four inhalations are ample to enable one to place each stitch, and the obstetrician may avoid the necessity of soiling his tender conscience with the threadbare lie that stitches introduced immediately after labor do not hurt much "because the perineal tissues are at this time but slightly sensitive."

TREATMENT OF SCIATICA AND NEURITIS OF OTHER PERIPHERAL NERVES WITH HOT SALINE SOLUTIONS.[1]

BY ALFRED GORDON, M.D.,
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The present study embraces sixteen cases of sciatica, eight cases of neuritis of the anterior crural nerve, six cases of neuritis of the external peroneal nerve, and two cases of neuralgia of the infraorbital nerve. The latter two may be contested as not being genuine cases of neuritis, since we are concerned exclusively with cases of neuritis. It should be borne in mind that a sharp distinction between neuralgia and neuritis cannot be established. The latter, of course, implies a material underlying basis, the former only a subjective symptom. Nevertheless in cases of neuralgia, even in recent ones, great presumptions exist in favor of their organic nature. Microscopical examinations of excised peripheral nerves and Gasserian ganglia have shown that in a number of cases degenerative changes were present. More or less intense alterations of a chronic inflammatory character have been found in the ganglion as well as in the peripheral branches in cases of neuralgia. Whether the primary inflammatory process lies in the ganglion or in the nerve trunk, it has not been as yet definitely established. Besides a peripheral and a ganglionic origin of pain in neuralgia, there may be also a central which can be seen from the fact that neuralgic pain is sometimes felt in another region than that of the nerve irritated. Finally a pathological state of the blood-vessels of the peripheral nerves may be the original cause of pain in a nerve.

According to Dana (*Medical News,* 1891), Thomas (*Deutsches Archiv f. Klin. Medizin,* v. xliii, p. 188), and Rose (*Transactions of the Med. Soc. of London,* v. xv, 1892), arteritis is the chief cause of neuralgia. In a contribution entitled "Is Neuralgia a Functional Disease," published in the *New York Medical Journal* of July 21, 1906, I put on record the pathological findings of eight cases of trifacial neuralgia. The duration of the affection ranged between seven years and three months. It was interesting to observe that in all of them without exception a more or less pronounced organic change was present either in the nerve bundles themselves or in the nervi nervorum, but in all cases the blood-vessels showed some thickening of their walls. Even in Case VI of my series, in which the neuralgia existed but three months, distinct nerve alterations were seen. In the light of these observations one must admit that the occurrence of degeneration of the peripheral nerves is frequent if not constant in neuralgia; that it is difficult if not impossible to draw a distinction between neuritis and neuralgia.

This being established let us now consider the chief subject of the study, viz., the therapeutic effect of hot saline solution on the element of pain in cases of involvement of peripheral nerve trunks. Without entering into long speculations as to the intimate influence of the fluid on the nerve, I may only recall that in my report on alcoholic injections for facial neuralgia (THERAPEUTIC GAZETTE, Aug. 15, 1909) I expressed the opinion that in view of frequent involvement of interstitial tissue of the nerve trunks the alcohol has some altering effect on this tissue (endoneurium,

[1]Read before the Section of Medicine of the College of Physicians, Feb. 28, 1910.

peri- or epineurium) by relieving the pressure upon the sensory nerve filaments, the irritation of which maintains the tenderness of the nerve trunks. That the connective tissue is particularly affected by alcohol can be seen from an experimental study on dogs (*Jour. of Nerv. and Ment. Dis.*, February, 1914), which I undertook with the object of determining whether alcoholic injections into peripheral nerves so frequently employed are innocuous or not, and if so to what extent. The histological study of the nerves into which the injections were made, also of Gasserian and spinal ganglia connected with those nerves, as well as of the central endings of the nerves in the medulla and spinal cord, enabled me to draw the following conclusions:

The pathological changes vary in motor and sensory and mixed nerves. In all cases the connective tissue is influenced. Motor nerves present a great degree of resistance to alcohol: the nerve fibers themselves resist perfectly, and the connective tissue alone is influenced. In sensory and mixed nerves not only the connective tissue but also the nerve fibers are involved, and the latter becomes damaged with great rapidity. Indeed, clinically we observe prolonged and even permanent sensory disturbances in cases of purely sensory nerves; also sensory, motor, and trophic disturbances in cases of mixed nerves. The rapidity with which material disturbances are set up in sensory and mixed nerves, also the progressive character of these disturbances, are all indications of a high susceptibility of such nerves to the effect of an irritating substance like alcohol. While the latter relieves pain, it produces nevertheless an objective sensory disorder which may remain permanent and lead eventually to trophic disturbances. In two of my cases I saw an eruption appear in the anesthetic area: in one case the patient happened to fall, and thus injured the skin over the affected region; it took three months before the wound healed up. Schlösser (*Klin. Monatsblatter f. Augenheilk.*, 1903, Bd. 41 (2), s. 244) records a persistent peroneal paralysis following treatment of sciatica by alcoholic injections. Brissaud, Sicard, and Tanon (*Revue Neurologique*, 1906, p. 633) observed paresis and trophic disturbances follow injections of alcohol into mixed nerves.

In view of these clinical and experimental data, which demonstrate the possibility of direct damage of alcohol to the nerves, I have abandoned the former method and commenced to use physiological salt solutions in its place. At first the solutions were used at various temperatures. After a large number of trials the observations which I made led me to believe that saline solutions of high temperature give better and more lasting results than when the fluid is tepid or cold. Accordingly the entire series was uniformly treated after preliminary medicinal treatment with injections of hot saline solutions. The latter were always prepared with freshly distilled and sterilized water for immediate use. Any large syringe of glass or metal can be used, and a needle which is used for lumbar puncture can be employed here. The needle is inserted first, and if no blood appears at its outer end the syringe is attached, after all air is expelled from it. The piston of the syringe should be pushed in slowly to avoid sudden expansion and tearing of the tissue and possible hemorrhages.

According to the nerve and to its localization the amount of fluid injected will vary. For the sciatic nerve, for example, I injected as much as 200 Cc. For the anterior crural nerve 50 Cc. was injected at a time. The same quantity was used for the external peroneal nerve. For relief of infraorbital neuralgia 10 Cc. was utilized.

As to the selection of the points for the treatment of various nerves the following rules were observed: For the sciatic nerve the point of juncture of the inner and middle thirds of a line passing between the tuber ischii and the great trochanter; for the anterior crural nerve the inner third of the outer half of a line passing between the anterior superior spine and the root of

the external genitalia; for the external peroneal nerve the base of the fibula; for the infraorbital nerve the foramen of the same name in the superior maxilla.

The distribution of pain and objective disturbances in my cases were as follows: In the sciatic neuritis there was, besides pain at the sciatic notch and along the posterior aspect of the thigh and leg, also difficulty in walking and hyperalgesia of the entire lower limb, besides Lasègue's sign, which, as is well known, consists of pain brought on by extension of the leg. Not all these symptoms were present in every case. In some sciatic cases the pain was absent in the calf muscles; in others there was no special difficulty of walking; and in still others the hyperalgesia of the limb was very slight or totally absent.

In the cases with neuritis of the external peroneal nerve there was pain on pressure immediately below the fibula, some paralysis of the external group of muscles of the leg and consequently some foot-drop, also some hypesthesia on the anteroexternal surface of the leg below the knee. All these symptoms were unequally distributed in all the cases.

In the cases with neuritis of the anterior crural nerve the quadriceps femori was paretic, and there was distinct diminution of objective sensibility on the anterointernal surface of the thigh, and on the inner side of the leg as far down as the ball of the foot. There was a marked tenderness on pressure over the uppermost portion of the anterior surface of the thigh. There was also a difficulty in raising the leg while walking, and an inability to stand on the right foot.

In the cases with infraorbital neuralgia the pain was immediately beneath the inferior border of the orbit; also in the gums of the upper jaw, and hyperesthesia over the side of the nose and upper lip.

The number of injections of hot saline solution varied in each individual case. The following is the general rule which I have adopted after many trials, subject to modifications in accordance with the duration of the relief obtained after each injection: In the sciatica cases an injection was given at first every four days. If the pain subsided after the third injection two subsequent injections were given —one a week. The following injections were given every two weeks if relief was not complete. Ordinarily the pain disappeared after the fifth or sixth injection. The same general rule was observed in the cases with neuritis of the anterior crural and external peroneal nerves. It is interesting to note that fewer injections were required for neuritis of these two nerves than in the cases with sciatica. In the infraorbital neuralgia the number of injections required was greater than in neuritis of any of the other nerves, inasmuch as one of the patients came for a period of four months each week for a treatment.

While some of the patients are still under observation, nevertheless the results so far obtained are far superior to those with any other method. I must add that no medication has been taken by the patients while under this local treatment. Hygienic and dietetic rules are nevertheless being kept up. As to local effects of the injections there is usually observed a slight swelling and a tenderness of the surrounding tissue. The swelling disappears in twenty-four or forty-eight hours. The tenderness remains somewhat longer. At no time were there seen trophic disturbances of any nature. The patients become able to move about and to walk on the street without much or any discomfort, their insomnia disappears, and they gain in weight. Some of the patients have been free from pain for months and even two years, others have some recurrences, but of a very mild nature. A repeated injection promptly relieves the disorder. I am unable at present to report permanent cures, as sufficient time has not elapsed since the treatment was commenced, but I am able to speak of great relief and of the superiority of this method over all others known to me, including surgery. I am warranted therefore to recommend it in the most emphatic manner.

EDITORIAL.

THE ALLEN TREATMENT OF DIABETES AND CAUTION.

Many of our readers are familiar with the plan of treatment of diabetes mellitus brought forward during the last two years by Dr. Allen because we noticed it in a leading article in the January issue, a number of reports have been made upon it in various medical journals, and also because we have noticed the appearance of the first and second editions of a little book which describes the methods followed by the originator of this plan. Like many plans it is not entirely original, differing only from temporary starvation of the diabetic in that the starvation is more rigorous and that it is instituted at once in its most severe form.

It has been known for years by every one who has studied this disease that diabetic patients can often be made sugar-free if their intake of food, particularly of the carbohydrates, is materially decreased or entirely arrested. It has also been known to be a fact that such patients when permitted to receive starchy foods are often found to be capable of retaining and utilizing a larger amount of sugar than before they were starved. And, again, it has been well known that certain forms of starch, like that found in the potato, in oatmeal, and in rice, are apparently more easily assimilated and retained by such patients than is the starch from which bread is made. Once more it can be said, without fear of contradiction, that those who have had the largest experience in the treatment of diabetes recognize the fact that in cases which have lasted long enough the body is not alone suffering from the loss of sugar, but that it also turns upon its fats and proteins, destroys them, and makes sugar in the process. The organism is therefore self-destructive under such conditions, the more so as the educts from this utilization of the fats result in the development of poisons which induce diabetic coma, and the acid character of these poisons robs the body of alkaline substances.

In other words, the most serious problem in a case of diabetes is not so much the large amount of sugar which may be eliminated, as the degree to which these secondary compensatory, but nevertheless destructive, processes are carried out.

We believe that it is essential for the safe and proper treatment of every case of diabetes that he should remain upon his ordinary diet until the physician, by daily examinations of the twenty-four hours' urine, obtains a clear conception of the average amount of sugar loss, and determines whether the ketone bodies, which are associated with acidosis, are present, and if so, in what relative quantities, since acetone shows that the body oxidizes oxybutyric acid into diacetic acid and then into acetone, whereas if oxybutyric acid is found in the urine it indicates that the oxidizing power of the body is unable to reduce this poisonous substance into innocuous acetone. The physician, in this way gaining a conception of the status of the patient in relation to his disease, can then institute such dietetic rules as will fit the particular individual, and, still continuing his examinations of the urine, be able to compare the results obtained with the standards reached or discovered in the first days of observation. To our minds Allen's proposition, which ignores these facts, jeopardizes a certain number of patients. We have more than once seen the institution of a strict antidiabetic diet plunge the patient from a condition of fair health into diabetic coma within a day or two.

We think it also a good rule and practice to recognize the fact that no one routine method of treatment can be employed in all patients suffering from the same disease, since that which suits one patient may be quite improper or ill-advised for another. In other words, the recommendation that the Allen treatment be instituted promptly in every case is, we believe, unfortunate and unwise. For these reasons we have

perused with much interest a contribution by Joslin, Brigham, and Hornor, in the *Boston Medical and Surgical Journal* of March 16 and 23, in which they report fourteen cases of diabetes mellitus unsuccessfully treated by fasting. Possibly no one in this country has done more toward the scientific investigation of this obscure malady than Joslin, and therefore anything which he may say in regard to this matter is of the greatest possible importance.

It is only fair to state that, in the opening of their article, these writers say that they thoroughly believe in the fasting treatment of diabetes as outlined by Dr. Allen, and that under this treatment their diabetic patients do better than ever before. They go on to say, however, that their object in publishing this paper is to show that some of the patients so treated have died, and to point out the apparent failure. They have used alkalies less and less in the treatment of acid intoxication, endeavoring to avoid the necessity for the use of alkalies by preventing acidosis. They have found it advantageous, however, in long-standing and complicated cases, without otherwise changing the habit or diet, to begin the treatment by omitting the fats in order to decrease the source of the acid bodies, after two days to omit the protein and simultaneously to halve the carbohydrates daily to 10 grammes, and then, if sugar has not disappeared from the urine, to fast the patient. There is not space in this leading article to quote in detail their various accurate and scientific observations, which were made upon the respired air and the contents of the urine. Those who wish to look into this matter further will find this portion of their study most interesting.

The opening paragraph of the second section of their paper states, in different words, the views we have already expressed in this article, as follows: "Changes in the diet and regimen of patients who have suffered from diabetes for many years are always dangerous, and particularly so when the case is of extraordinary length. Treatment of such individuals should never be undertaken lightly nor without a full realization of the gravity involved." Their feeling in this view is emphasized by their quoting a case in which for nine days after the patient came under observation she was not allowed to make the slightest possible change in her regimen. These authors close their paper with these words: "The experience derived from these patients has led us to adopt a preparatory treatment to fasting for very severe, long standing, and complicated cases. The plan which they follow we give below, as printed in the journal from which we quote:

SUMMARY OF TREATMENT.

Fasting. Fast until sugar-free. Drink water freely, and tea, coffee, and clear meat broth as desired. In very severe long standing and complicated cases, without otherwise changing habits or diet, omit fat, after two days omit protein and halve carbohydrate daily to 10 grammes, then fast.

Carbohydrate Tolerance. When the 24-hour urine is sugar-free, add 150 grammes of 5-per-cent vegetables and continue to add 5 grammes carbohydrates daily up to 20, and then 5 grammes every other day, passing successively upward through the 5, 10 and 15 per cent vegetables, 5 and 10 per cent fruits, potato and oatmeal to bread, unless sugar appears or the tolerance reaches 3 grammes carbohydrate per kilogramme body weight.

Protein Tolerance. When the urine has been sugar-free for two days, add 20 grammes protein (3 eggs) and thereafter 15 grammes protein daily in the form of meat until the patient is receiving 1 gramme protein per kilogramme body weight, or if the carbohydrate tolerance is zero, only ¼ gramme per kilogramme body weight.

Fat Tolerance. While testing the protein tolerance, a small quantity of fat is included in the eggs and meat given. Add no more fat until the protein reaches 1 gramme per kilogramme (unless the protein tolerance is below this figure), but then add 25 grammes daily until the patient ceases to lose weight or receives not over 40 calories per kilogramme body weight.

Reappearance of Sugar. The return of sugar demands fasting for 24 hours or until sugar-free. The diet is then increased twice as rapidly as before, but the carbohydrate should not exceed half the former tolerance until the urine has been sugar-free for two weeks, and it should not then be increased more than 5 grammes per week.

Weekly Fast Days. Whenever the tolerance is less than 20 grammes carbohydrate, fasting should be practiced one day in seven; when the tolerance is between 20 and 50 grammes carbohydrate, upon the weekly fast day 5 per cent vegetables and one-half the usual quantity of protein and fat are allowed; when the tolerance is between 50 and 100 grammes carbohydrate, the 10 and 15 per cent vegetables are added as well. If the tolerance is more than 100 grammes carbohydrate, upon weekly fast days the carbohydrate should be halved.

STRICT DIET.

MEATS, FISH, BROTHS, GELATINE, EGGS, BUTTER, OLIVE OIL, COFFEE, TEA, AND CRACKED COCOA.

FOODS ARRANGED APPROXIMATELY ACCORDING TO PER CENT OF CARBOHYDRATES.

VEGETABLES (FRESH OR CANNED).

*5 per cent.**

Lettuce	Sauerkraut	Okra
Cucumbers	Beet greens	Cauliflower
Spinach	Dandelion greens	Egg Plant
Asparagus	Swiss chard	Cabbage
Rhubarb	Celery	Radishes
Endive	Tomatoes	Leeks
Marrow	Brussels sprouts	String-beans
Sorrel	Watercress	Broccoli
	Sea kale	

10 per cent.

Pumpkin	Squash	Onions
Turnip	Beets	Mushrooms
Kohl-Rabi	Carrots	

15 per cent.

Grees peas	Parsnips	Canned Lima beans
Artichokes		

20 per cent.

Potatoes	Baked beans	Boiled rice
Shell beans	Green corn	Boiled macaroni

FRUITS.

5 per cent.

Ripe olives (20% fat)	Grape fruit

10 per cent.

Lemons	Strawberries	Peaches
Oranges	Blackberries	Pineapple
Cranberries	Gooseberries	Watermelon

15 per cent.

Apples	Blueberries	Raspberries
Pears	Cherries	Huckleberries
Apricots	Currants	

20 per cent.

Plums	Bananas	Prunes

NUTS.

5 per cent.

Butternuts	Pignolias

10 per cent.

Brazil nuts	Hickory	Filberts
Black walnuts	Pecans	

15 per cent.

Almonds	Beechnuts	Pine nuts
Walnuts (Engl.)	Pistachios	

20 per cent.

Peanuts

40 per cent.

Chestnuts

MISCELLANEOUS.

5 per cent.

Unsweetened and Unspiced Pickle, Clams, Oysters, Scallops, Liver, Fish Roe.

(30 grammes 1 oz.) CONTAIN APROXIMATELY	PROTEIN. G.	FAT. G.	CARBOHYDRATE. G.	CALORIES.
Oatmeal, dry weight	5	2	20	120
Meat (uncooked, lean)	6	3	0	50
Meat (cooked, lean)	8	5	0	75
Broth	0.7	0	0	3
Potato	1	0	6	25
Bacon	5	15	0	155
Cream, 40%	1	12	1	120
Cream, 20%	1	6	1	60
Milk	1	1	1.5	20
Bread	3	0	18	90
Butter	0	25	0	225
Egg (one)	6	6	0	75
Brazil Nuts	5	20	2	210
Orange or Grape Fruit (one)	0	0	10	40
Vegetables 5 and 10% group	0.5	0	1 or 2	6 or 10
Oysters, six	6	1	4	50

1 gramme protein, 4 calories.
1 gramme carbohydrate, 4 calories.
1 gramme fat, 9 calories.
1 gramme alcohol, 7 calories.
6.25 g. protein 1 g. nitrogen.
1 kilogram=2.2 pounds.
30 grammes (g) or cubic centimeters (c.c.)=1 ounce.
A patient "at rest" requires 25 per kilog. body weight.

*Reckon available carbohydrates in vegetables of 5% group as 3%, of 10% group as 6%.

The point which the writer of this article wishes to make, and emphasize, is not that the Allen treatment of fasting diabetics is essentially erroneous, or that it will not, in a large number of cases, produce excellent results, but that it cannot be applied haphazard in all cases, and that, if so applied, it will sometimes induce disaster, for every case of diabetes should be approached by the physician "reverently, discreetly, and in the fear of God."

THE PITUITARY BODY AND ITS EFFECTS UPON NUTRITION AND DEVELOPMENT.

Entirely apart from the extraordinary interest and importance which is centered in the active principle of the posterior portion of the pituitary body as exercised upon the circulatory apparatus and the uterus, it is becoming increasingly evident that this posterior lobe exercises other functions in the body and that the anterior lobe may possess valuable therapeutic properties in a limited class of cases which, because they cannot be benefited in any other way, ought to receive special attention at the hands of those who keep themselves abreast of all the real advances which are made in our knowledge concerning the glands of internal secretion. We have known for a number of years that part of the gland has an extraordinary effect on growth, and also that it is connected with the ability of the body to retain sugar. Constantly increasing evidence shows that the anterior lobe in early life has much to do with physical development, and later with the development of the sexual organs and sexual characteristics.

One of the most exhaustive and interesting papers which have appeared in connection with this important subject has been contributed by Goetsch to the *Bulletin of the Johns Hopkins Hospital* for February, 1916, who reports a number of experiments made upon the lower animals. He shows, amongst other things, that the feeding of young male rats with extract of the anterior lobe resulted in a definitely stimulating effect upon the growth of the

animal body as to gain in weight and in its general appearance of vigor. There was also earlier descent of the testicles and the glands appeared larger and more vascular than the testicles of a control animal which, at the start of the experiment, had been of the same size. In other words, the use of the anterior lobe extract shortened the period of complete sexual development by one month, or one-third. When the posterior lobe extract was employed in another experiment it failed to produce a stimulating influence upon the development of the sexual glands in any way comparable to that exerted by the anterior lobe extract.

Further experiments upon the effects of the anterior lobe extract upon breeding and pregnancy were also performed. In the case of female rats there was an increase in weight and growth comparable to that which occurred in the male rat when the anterior lobe extract was given, and a pair of rats that received the anterior lobe extract bred at the age of three and one-half months, which is much earlier than is usually the case. An examination of the ovaries of the fed animals showed that they were better developed at the same age than in those which did not receive anterior lobe. There was greater vascularity and the Fallopian tube had a more freely branched fimbriated extremity, the uterus was better developed, and the sexual apparatus better fitted for functional activity. The author then goes so far as to conclude, from some experiments carried through more than one generation, that the second generation may be influenced by feeding the first with the anterior lobe.

If the entire gland is given the results are not so marked, but the author seems to think that in instances where faulty development exists the best results will be obtained by giving pituitary whole gland extract rather than the extract of one lobe. It may, however, be definitely stated that the extract of the posterior lobe does not stimulate growth in general and the development of the sexual glands as does the anterior lobe even after a very short period of use.

What the exact bearing of this research will be upon human medicine it is at present difficult to determine. An interesting field of observation is, however, opened to physicians who have cases which fail to develop, as puberty approaches, to the extent which is normal. It would appear that they are justified, from this and other researches, in administering extract of the anterior lobe, the more so as a considerable number of cases have now been reported in human beings in which great improvement has followed its use.

CASES IN WHICH FOOT-PLATES FAIL.

In hospital practice and to a large extent in private practice physicians often meet with painful feet, painful legs, or painful back, which seem to have their origin in so-called "flatfoot." A certain proportion of these patients, particularly in youth, can be benefited by exercise designed to improve the strength and formation of the arch of the foot. In elderly people, particularly if they have gained greatly in weight, such measures often fail, and so-called "inner soles" are often advantageous. In some instances the patient gives a long history of having been treated for gout in the feet, or for muscular rheumatism, and has failed to obtain any relief after trying everything possible, from the salicylates and iodides to the celebrated mineral springs in this country and in Europe.

In the discussion of the treatment of any condition it is as necessary to recognize states which cannot be improved by ordinary familiar measures as it is to recognize those which can be improved, and, therefore, we wish to call attention to a type of patient who, it is true, suffers from "flatfoot," but who in addition presents feet which are cyanotic, congested, covered with clammy skin, and manifestly suffering from a poor arterial circulation, with the veins greatly enlarged. Manipulation of the feet does not cause pain, but the patient often complains bitterly of such pain when in bed, and may be so lame as to be incapacitated for walking. The fact that the symptoms are better in warm weather than in cold

does something to increase the view, on the part of the patient, that he has rheumatism, the more so as the pain extends up the legs.

In the *Journal of the American Medical Association* of November 27, 1915, Frauenthal writes upon this important subject, and states that the condition is particularly prevalent among Russians, Poles, and Galicians; that its underlying cause is obliterating endarteritis, as is indicated by the pulsation in the arteries supplying the feet; furthermore, that such feet may play an important part in medicolegal cases where there are suits for damages against corporations, and still more important that any operative interference, even for minor conditions, on the part of the physician may result in grave complications, because healing does not easily take place and infection readily occurs.

He states that the best method of treatment is the administration of ½ grain of extract of thyroid gland three times a day, the subcutaneous injection of from 300 to 500 Cc. normal salt solution, and the daily exposure of the patient's feet for twenty minutes to white light to the point of tolerance of heat. In this type of case so-called inner soles or foot-plates make a patient distinctly worse and should be ordered only with great care.

THE SIGNIFICANCE OF VESICAL SYMPTOMATOLOGY IN RENAL CONDITIONS.

There is a commonly accepted belief that vesical symptoms, aside from frequency, at times slight urgency, and during renal colic difficulty in passing urine, are as a rule not characteristic of either medical or surgical affections of the kidney; nor is this belief negatived by Braasch (*Transactions of the American Association of Genito-Urinary Surgeons,* vol. x, 1915), who notes that the renal conditions which most frequently cause vesical symptoms are tuberculosis, pyelonephritis, and lithiasis; in the two former conditions there is usually an associated cystitis. Of 203 cases of renal tuberculosis reported by him several years ago practically all exhibited vesical symptoms of months or many years' duration, and many of them were treated by lavage of the bladder and various internal medicaments. Braasch thinks that all cases of persistent irritability of the bladder with pyuria should be regarded as possibly due to renal tuberculosis until the contrary be proved.

Early recognition is of prime importance, as it indicates as a rule an entirely effective and safe surgical procedure, and it prevents the unfortunate deep-seated infection of the bladder which is so difficult to eradicate. *Per contra,* a well-advanced renal tuberculosis with comparatively slight irritation of the bladder may occur particularly in the female. Gross and free hematuria originating in the tuberculous kidney may occasionally occur before any vesical irritability has developed. The earliest vesical symptom is increased frequency somewhat out of proportion to the polyuria.

Diffuse infections of the renal parenchyma and pelvis with organisms other than tubercle bacilli, which come under the term of pyelonephritis, usually cause a variable degree of infection of the bladder; the resultant cystitis, being as a rule less severe than that which occurs in tuberculosis, is characterized by less marked symptoms. At times a differential diagnosis even with the cystoscope is hard to make. Pyelonephritis as a cause of cystitis in the adult male was found in 109 of 121 cases recently reported in the Mayo clinic. Hence all cases of cystitis should be examined with a view to the possibility of renal infection. This of course implies ureteral catheterization. Nor does a single negative finding exclude the possibility of a quiescent renal infection. Demonstration of dilatation in the outline of the renal pelvis or ureter is regarded by Braasch as conclusive evidence of previous active infection even though the urine fails to show evidence of active infection on microscopic examination. A pyelogram will demonstrate this, and the finding may be further corroborated by renal functional tests, a pyelonephritis being characterized by a considerable decrease in the phenolsulphonephthalein output, whereas

there is but little decrease with pyelitis. At times this test fails.

The absence of vesical irritability coincident with pain would be a factor in exclusion in the interpretation of a doubtful renal or ureteral shadow when stone is suspected. Pain with low ureteral stone is localized to the suprapubic or low inguinal area and is usually the result of a localized periureteritis. It is particularly in children that the radiation of pain in renal lithiasis may be largely referred to the area of the bladder.

There is a type of vesical irritability characterized by the term neurosis for which no cause can be found, nor is an extravesical cause of bladder symptoms at all common. When vesical symptoms do result from extra-vesical cause, they are the result of (1) pressure of a tumor; (2) mechanical interference; (3) malignant involvement; or (4) direct extension of an adjacent inflammatory process.

A very small proportion of uterine tumors cause any vesical symptoms. Secondary involvement of the bladder is also comparatively rare, at least from the uterus; from the rectum it is somewhat more common. Extension to the bladder of acute inflammatory pelvic conditions is also rare; it can be recognized by the cystoscope.

THE PROGNOSIS OF URETHRAL STRICTURE.

To the reviewer of current literature it would seem that urethral stricture has been practically abolished from the list of surgical affections, though there are a sufficient number of articles dealing with gonorrhea and its consequences to lead to the inference that urethral narrowings may still be of comparatively frequent occurrence. It is true that stricture if not traumatic is always the result of a chronic urethritis of gonorrheal origin, the inflammation persisting in the follicle and perifolliculitis developing with a resultant fibrosis gradually lessening the lumen of the canal. It is also true, though this would not appear from current literature, that there have been no material advances made in the treatment of acute gonorrheal urethritis in the last twenty or thirty years, if we except the prophylaxis, the abortive treatment, and the generally accepted view that those irrigations and injections are least harmful which are least irritating.

It might seem that the therapeutics of stricture is so entirely settled that further writing on the subject is unnecessary. This view is not in consonance with the clinical experience of surgeons who see any considerable number of genito-urinary cases. There is certainly a growing tendency to refer stricture cases to the specialist, and therefore these cases receive more skilful and efficient treatment than in former times.

Keyes (*Transactions of the American Association of Genito-Urinary Surgeons*, vol. x, 1915), in an effort to throw some light upon the prognosis of urethral stricture, has collected the available data in the office case books of himself and his father concerning 583 cases of narrowing of gonorrheal origin. Sixteen cases were treated with electrolysis, with no deaths and very little advantage; forty-eight by divulsion, with one death by pyemia (this patient was divulsed to 45 F.); two hundred and eighty-three by sounds without any operation, with one death, anuria incident to retention relieved by filiform and the passage of sounds. There were 236 operated upon, 112 by external urethrotomy, with seven deaths, five being from urinary sepsis, one from hemorrhage, and one from rupture of an aortic aneurism in the third week. Of the 124 operated upon by internal urethrotomy only one died, of renal insufficiency and sepsis on the second day. The combined immediate mortality of these 583 cases was 10 deaths, or less than 2 per cent—a small average, if we consider that these data extend from before 1870 to the present time. In a number other operations, such as incision of the bladder neck, lithotomies, urethral dissections, nephrotomies, and prostatectomies, were done in connection with the urethral cutting.

Keyes defines stricture as that infiltration of the urethral wall which may be expected to contract progressively. Strictures of a large caliber may be considered simply as

the sclerotic base of a chronic urethritis. If they be dilated sufficiently to cure the urethritis, they will not contract except as the result of a new inflammation.

Keyes shows that most strictures develop within a year of a gonorrhea and submit to a dilatation within two or three years of their inception; a very large minority develop very late or excite symptoms which the patient may neglect for many years. Stricture at or anterior to the peno-scrotal angle contracts to a far less degree than stricture posterior to this point. As to the relapse of stricture cases, they may stay well for periods of ten or fifteen years without treatment, but rarely without symptoms.

The criterion of cure would be five years without treatment and an unobstructed passage of a full-sized sound. Five years without treatment will not suffice. Many of Keyes's patients kept their lesions under control for many years at the expense of having a full-sized sound passed once a year in order to forestall recontraction. If the patient uses a sound smaller than 26 or 28 it usually has to be passed every month or so, or even oftener. An overwhelming majority of stricture cases refuse to continue passive sounds and so relapse into retention, periurethritis, and renal complications.

Internal urethrotomy will cure simple uncomplicated stricture of the pendulous urethra. These strictures are as a rule not amenable to dilatation. As many cures were accomplished by internal urethrotomies of the pendulous urethra up to 32 or 33 as by cutting to 38 and 40.

Stricture of the bulb can be best controlled by dilatation up to 27 to 29. Of the many cases dilated in this series, although of much greater size, none have remained long enough to be in any sense a cure. Internal urethrotomy is called upon only to divide dense scar tissue. This can usually be done without cutting any higher than 31 or 32. Deeper incision is dangerous and has no distinct advantage, for a urethra cut as high as 36 or 38 F. will usually be found to have contracted to about 30 F. several years after operation.

Stricture of the bulb may be controlled by dilatation to about 30 F. size. It then must be kept open for the rest of the patient's life by the passage at least once a year of a full-size sound to forestall or to diagnose recontraction. From which Keyes concludes that no patient can ever be guaranteed cured of stricture, least of all in the bulbous urethra, yet five apparent cures have been observed, the duration being from 12 to 28 years.

REPORTS ON THERAPEUTIC PROGRESS.

THE RADICAL TREATMENT OF RHEUMATOID ARTHRITIS.

In the *Lancet* of January 15, 1916, ROWLANDS says that it is convenient to recognize the following types of rheumatoid arthritis marked off according to age, for they exhibit certain features characteristic of each:

A. The adolescent. The disease here usually attacks the larger joints—the knees, hips, wrists, and shoulders in this order of frequency—but should there have been an old injury to either of these joints this is the one first affected. It is accompanied by severe pain, and the onset is more rapid than in the other types. It is often mistaken for tuberculous disease, and he has seen it treated as such with unfortunate results. Rowlands remembers, for instance, being called to see a case of this kind in which one leg had been amputated above the knee and the opposite knee and hip were attacked, and in which the septic condition of the patient's mouth had been quite overlooked. The treatment of such cases is difficult, but if only the diagnosis is made early and the source of infection treated the results are quite good.

B. Middle-age type. This commonly begins about the age of forty, and the largest number of all cases of rheumatoid arthritis belong to this group. It is the

form of disease most amenable to treatment, provided the source of infection can be found and dealt with. Mention may be made of a subvariety of this group, where the progress of the disease is rather more acute with exacerbations of acute swelling of the joint with fluid.

C. Senile type. This occurs in patients over fifty and is not accompanied by much pain; it usually attacks the smaller joints to begin with; wasting of the muscles and deformity are pronounced. Owing to the absence of pain patients coming under this group rarely seek treatment until the condition is very far advanced, when, of course, it is less amenable to treatment.

The cardinal point of the treatment is disinfection of the original focus, but it is only in the early cases that removal of the source of infection will at once cure the condition. In the cases of longer standing the toxemia itself has also to be treated, and for this purpose vaccine therapy has proved of great assistance. Autogenic vaccine should always be prepared, the use of stock cultures being of little avail. The pathogenic organism can sometimes be isolated only with considerable difficulty; in such cases it is often possible to discover it in the urine, and this should always be examined if the organisms are not obtained elsewhere. The urine should be drawn off with all aseptic precautions into a sterile flask and incubated in bulk for eight to twelve hours. This should now be inoculated on to suitable media. In the case of pus a swab is taken by means of wool attached to a sterile glass rod, which it is convenient to keep in a sterile test-tube of about 7 inches in length; broth is now inoculated by cutting off the wool end of the glass rod with a sterile file and dropping it in. This is incubated for twelve to eighteen hours; a slide is then made and stained, and plates of suitable media are inoculated. For streptococcus, bacillus coli, and bacillus pyocyaneus, Rowlands finds the media suggested by Captain S. R. Douglas to be excellent; one can thus isolate the organism and obtain pure cultures, if necessary by reinoculation. An eighteen hours' pure growth is now taken and made into an emulsion with a 0.5-per-cent solution of carbolic in saline solution. It is well broken up with a mechanical shaker and then counted. The next process is to submit the emulsion to heat in a steam bath at 55° C. for forty minutes; it is then stored in rubber-capped sterilized bottles and diluted as required.

The dosage is a matter that greatly depends on the type of case as well as on individual features in the patient, such as age; in old people one has to be more careful to avoid unpleasant reactions. In fairly acute cases Rowlands makes a plan of beginning with a dose of five millions if the organism is a streptococcus, pneumococcus, or diphtheroid bacillus, the dose being increased according to the reaction. With the bacillus coli he begins with ten millions in acute cases, and in the chronic cases, on the other hand, he begins with five times these doses.

The reaction may be one of three kinds —local, arthritic, and constitutional. The local reaction at the site of inoculation may be severe, especially in the case of the bacillus coli; usually it is little more than a slight inflammation and itching of the skin. The arthritic reaction is important as being the chief guide to subsequent doses employed. Rowlands always aims at bringing about a slight exacerbation of the joint symptoms, such as swelling, heat, and pain. If the patient is kept at rest this soon subsides, as a rule within a few days, but should there be much pain a local application of ice gives relief; when this subsidence has occurred the patient usually reports marked improvement. The next dose following a rather acute reaction should not be increased and there should be no great reaction. Following this the dose may now be increased until one has reached the following numbers: bacillus coli, and paratyphoid, two hundred millions; pneumococcus, streptococcus, pyocyaneus, and diphtheroid bacilli, fifty millions. There should be an interval of from seven to ten days between the injections, and when there is very marked improvement this may be in-

creased to fourteen or twenty-one days; the treatment should be continued for at least a year, and if possible the injection should be given in the evenings. Some constitutional reaction may be complained of by a few patients; it consists of a general feeling of malaise, slight headache, sickness, palpitation, perhaps a rise of temperature with a slight rigor. The last-named symptom Rowlands has generally seen in cases inoculated with a vaccine of bacillus coli.

The usual forms of treatment should be administered simultaneously with the vaccine therapy, including attention to the general condition, removal to a bracing climate if possible, massage, baths, tonics, and removal of sources of worry; but, as has been remarked above, none of these will cure the malady unless the cause of it is treated at the same time, and this means the removal of the septic focus, supplemented with specific vaccine therapy. If full advantage is taken of the measure now at our disposal Rowlands ventures to suggest that rheumatoid arthritis will lose most of its present terrors.

MANAGEMENT OF GONORRHEAL ULCERATION OF THE CORNEA.

In the *Southwest Journal of Medicine and Surgery* for January, 1916, GIFFORD says that when ulceration of the cornea occurs in this disease, the most important indication is to use as vigorous measures as are safe, to cure the conjunctival infection. No matter what application is made to the ulcer it is apt to spread until the discharge is checked; and conversely, if the discharge is checked the ulceration is apt to stop without any special treatment. Nevertheless, in addition to using 8 per cent silver, it is well to apply trichloracetic acid or tincture of iodine thoroughly to the ulcer; and if in spite of this it continues to spread, Gifford makes a paracentesis through the center of the ulcer; or, in specially bad cases, he does a keratotomy, not across the center of the ulcer as in the Saemisch cut, but through the healthy tissue at the central margin of the ulcer.

He has found such a cut to be a very effective bar to the progress of any bad ulcer; the reason probably being that like all corneal wounds it is rapidly filled with a plug of new epithelium, which offers a much greater resistance to the infection than does the corneal stroma. This may be in line with the incisions that are recommended by some men to head off erysipelas.

He has a prejudice against the cautery in gonorrheal ulcers. In the few cases in which he has used it he has received the impression that the eschar forms a favorable starting-point for reinfection. Besides the common form of gonorrheal ulcer, which starts in the center of the lower quadrant, he has seen a few cases of marginal ulceration. In one of these a very narrow linear ulcer, which on his first visit seemed rather insignificant, progressed so rapidly that after twenty-four hours practically the entire cornea was necrotic. These ulcers sometimes get started under the overhanging chemotic conjunctiva; so that where the margin is concealed for more than a day or two by such chemosis the conjunctiva should be pulled back, or if necessary dissected back, in order to allow careful inspection of the whole margin. In one case with such an ulcer Gifford believes he saved the eye by actually cutting away quite a large chunk of the dropsical conjunctiva. If he were to see another marginal ulcer, he believes he should treat it by the method of Aubaret, which consists in dissecting the swollen conjunctiva back from the cornea for a quarter of an inch or so, and after treating the ulcer with some form of cauterization allow the raw surface of the conjunctiva to slide over the cornea, which it does by virtue of its dropsical condition. This appeals to him strongly as it brings a raw, well-nourished surface to the aid of the non-vascular cornea, according to the principles first advocated by Kuhnt. Indeed, the method may well be used in all gonorrheal ulcers, a stitch or two being added if necessary to bring the conjunctiva well over the ulcer. The great objection to the ordinary Kuhnt

method of stitching the conjunctiva over all kinds of ulcers is that one does not feel sure of what is going on under the conjunctival flap, but with the chemotic conjunctiva of gonorrheal conjunctivitis the stitch can be tied loosely and untied so that the ulcer can be inspected as often as desired.

A word as to prophylaxis. Where a patient comes to Gifford with only one eye affected, he, of course, seals up the other as promptly as possible; but it has always seemed to him that before doing this we ought to take into consideration the fact that the second eye, although it shows no sign of inflammation, may actually have been infected a short time beforehand. Granting this, it would seem to follow logically that before covering the eye we should take the same precautions that we would with a new-born infant's eyes in a suspicious case.

As to the method of applying the protective watch-glass, the original method of Buller, according to which the watch-glass is included between the layers of gauze, which are then fastened to the skin, is much more troublesome and less secure than if the watch-glass is pasted directly onto the skin with a very thin layer of cotton and collodion. If a watch-glass doesn't happen to be at hand, a temporary shield can be made of pasteboard, or by stiffening an arched layer of cotton with collodion and cutting two or three small holes in the center.

In conclusion, Gifford trusts he will be excused if he takes a short excursion into the unknown, and makes some suggestions as to the treatment of gonorrheal ophthalmia, the practical utility of which he has not yet tested. Starting with the fact that the great majority of ophthalmologists occasionally lose an eye in spite of all that they can do, and that this loss is occasioned by the persistent contact of the gonorrheal discharge with the cornea, and adding to this the fact that the cure of the infection is delayed and the danger to the cornea prolonged because we fear to use remedies as strong as is necessary, it can readily be seen that if we adopt some measure which will actually keep both the discharge and any remedies which may be used from coming into contact with the cornea, we shall have made a long step toward the solution of the problem. For some time Gifford has been experimenting to find an easy and practical method for accomplishing this end. He has tried disks of rubber tissue thinly coated with vaselin, but these were too easily displaced. The idea of using the Thiersch flap for this purpose he has tried on the rabbit, but a graft taken from himself proved to act as a foreign body, and he found it practically impossible to get a suitable autograft from the rabbit.

Some years ago Goldzieher, of Budapest, proposed covering the entire cornea with two conjunctival flaps which he dissected loose by vertical incisions at each side of the cornea and then transposed them; so that the right flap was applied to the left side of the cornea and the adjacent sclera and the left flap to the right side. Not having seen his paper in the original, Gifford does not know whether Goldzieher designed this method for the purpose of curing corneal ulcers or for preventing them. If it was the latter, he is entitled to priority for what Gifford considers a most fertile idea. Just why it should be necessary to use so complicated a method Gifford does not understand. If sutures are to be used at all, it seems as if the ordinary purse-string suture or three side-to-side mattress sutures would answer just as well. He is still inclined to favor a Thiersch flap covering, as it avoids the necessity of sutures and can be renewed daily if desired, with very little trouble; but waiving this point, Gifford would suggest as the most rational abortive treatment for gonorrheal ophthalmia the following:

A free application of 1-per-cent silver nitrate is first made to the conjunctiva and the sac thoroughly washed out, and the edges of the lids and surrounding skin carefully wiped to temporarily clear the field of germs. Then, the conjunctiva having been dissected loose around the cornea, the latter is protected either by a Thiersch flap

with the edges tucked under the conjunctiva or by drawing the latter over the cornea by a purse-string or mattress suture. Then with the reclining patient looking sharply up, while the upper lid is held well away from the globe (by hooks or by sutures if necessary) the upper cul-de-sac is filled with 4-per-cent silver nitrate and is deliberately but gently swabbed until it is certain that the solution has reached every fold and cranny. This is then syringed out and the lower cul-de-sac treated in the same way. The same solution is then injected into each canaliculus and is applied to the edges of the lids, the lashes, and the surrounding skin. Repeat every twelve hours until the infectious discharge stops. If the cure is not complete after two or three applications, use 8-per-cent silver in the same way. Whether strong silver, 20- to 50-per-cent protargol, 10-per-cent permanganate of potash, or something else may prove to be best is immaterial; the point is that in this way the remedy can be used with such freedom that Gifford believes two or three days will suffice for a cure, and that meanwhile the cornea will be protected from the action of the discharge. This, of course, is only a dream, but it may well be that some one will realize it before he has a chance.

SERUM SICKNESS IN A SERIES OF FIVE HUNDRED PATIENTS TREATED WITH DIPHTHERIA ANTITOXIN.

In the *Archives of Internal Medicine* of January 15, 1916, STURTEVANT reaches these conclusions:

1. A varying proportion of patients receiving modified horse serum react with rash and other symptoms. The larger the amount of serum the larger the number reacting.

2. Most patients react from the fifth to the ninth day, though reaction may take place from the first to the seventeenth day and perhaps later. The time of reaction has no relation to dosage.

3. Rash may be erythematous or urticarial. The larger the dose the greater is the proportion of urticarial rashes. Vesicular urticaria is sometimes, though rarely, seen.

4. Nausea and vomiting occurs in about one in five reacting cases. It is more likely to occur and to be severe and prolonged if the dose of serum is increased.

5. Albuminuria and edema occur occasionally, either together or independently.

6. Joint symptoms occur in about 14 per cent of reacting cases and may be severe.

7. If a given amount of serum be given in two or more doses, it seems not less likely to produce reaction than if given in one injection.

HYPERTHYROIDISM.

MARSHALL in *Northwest Medicine* for January, 1916, makes the following observations:

1. Hyperthyroidism is a condition in which the secretion of the thyroid is quantitatively increased or qualitatively altered, or possibly both conditions exist. It is divisible into low-grade hyperthyroidism, in which parenchymatous degenerations predominate over the toxic functional disturbances, and high-grade hyperthyroidism, in which the toxic disturbances predominate.

2. The diagnosis is made by being thoroughly conversant with the symptoms which may be dependent upon a hyperactive thyroid. The most common error is to overlook hyperthyroidism in cases diagnosed as functional heart disease, hysteria, and neurasthenia, and to fail to appreciate the rôle hyperthyroidism has played in the causation of heart, kidney, and liver degeneration.

3. All cases should first be treated medically, and if improvement begins and continues satisfactorily, it should be persisted in. If improvement does not begin, progresses unusually slowly, or acute exacerbation occurs without omission of some important element of treatment, it should be treated surgically. The patient should not be sent to a hospital one day and a thyroidectomy done the next. All cases should be improved as much as possible by medical

treatment before surgery is done. If the case be very severe, preliminary ligation of one or both sets of thyroid vessels should be done, with thyroidectomy at a later date.

SALICYL IN BLOOD AND JOINT FLUID OF INDIVIDUALS RECEIVING FULL THERAPEUTIC DOSES OF SALICYLATE.

In the *Journal of Pharmacology and Experimental Therapeutics* for February, 1916, SCOTT, THOBURN, and HANZLIK state that the percentage concentration of salicyl in the blood and joint fluid of rheumatic individuals receiving full therapeutic doses of salicylate is approximately the same.

There is no demonstrable free salicylic acid in the joint fluid of individuals suffering with rheumatic fever.

THE EFFECTS OF PROLONGED FEEDING OF ALUMINUM SALTS.

In the *Journal of Pharmacology and Experimental Therapeutics* for February, 1916, ROTH and VOEGTLIN state that when the aluminum, in the form of aluminum lactate or sodium aluminum lactate, is fed to rabbits, cats, or dogs for long periods of time, certain distinct effects are produced. Rabbits which received by stomach-tube the equivalent of 20 mgm. of aluminum per day died after about two months. The only symptom which they manifested was diarrhea. At autopsy corrosion of the stomach, together with congestion, and a hemorrhagic condition of the intestinal mucosa were found. If the daily doses were increased to 80 mgm. there usually resulted besides diarrhea some loss in weight and certain urinary changes, namely albuminuria, accompanied by many hyaline and granular casts. At autopsy the animals which received 80 mgm. per day showed numerous areas of intestinal hemorrhages and a few areas of ulceration, which were especially marked in the large intestine.

Cats which received aluminum lactate as a 10-per-cent aqueous solution by stomach-tube in daily doses varying from 40 to 80 mgm. died after three to seventeen days. When given in this way, vomiting occurred on the first or second day and continued at irregular intervals until the death of the animal. The desire for food, while not wholly lost, was greatly decreased, and all the animals lost in weight. Shortly before death albuminuria appeared. At autopsy varying degrees of corrosion of the stomach mucosa and congestion of the upper part of the small intestines were generally found, while in some animals the spleen, liver, and kidneys were also congested. Two cats that were given aluminum lactate in milk in 20- to 40-mgm. doses for a period of about eight weeks seldom vomited after receiving the mixture and showed alternating periods of diarrhea and constipation. At the end of seven weeks the animal which received the 40-mgm. dose developed a slight albuminuria, and at autopsy showed changes similar to those occurring in dogs.

In dogs daily doses of 20 mgm. of aluminum lactate for periods of four months produced diarrhea only. At autopsy, however, congestion and scattered hemorrhages were found in the stomach, while the intestines showed not only congestion but many areas of minute hemorrhages and thickening of the intestinal mucosa.

THE INTRASPINAL TREATMENT OF SYPHILIS OF THE CENTRAL NERVOUS SYSTEM, ACCORDING TO THE METHOD OF SWIFT AND ELLIS.

In the *Archives of Internal Medicine* of January 15, 1916, DEXTER and CUMMER state that the results in six of these ten cases have been a symptomatic improvement so emphatic that the patients' economic efficiency has been resored. They are able to work and to enjoy life to all intents and purposes as normal individuals.

The writers feel that the best results will be obtained in cerebrospinal lues, and in tabes of the early or moderately advanced types. In far-advanced tabes the results are in most cases dubious to say the least. Their own experience with paresis is so

limited that they should have no right to make any generalizations. It seems probable to them, however, that very little can be done to improve permanently a paresis once it is well established.

In concluding they feel that they can state fairly that the Swift-Ellis method is safe when the original technique is followed out to the letter. The claim of the originators that it is a valuable adjunct to the treatment of syphilitic involvement of the central nervous system is sustained as far as dorsal and cerebrospinal syphilis are concerned. It is a method which is not essential in all cases, but which applied carefully and controlled intelligently will bring about definite amelioration in symptoms and in laboratory signs where other accepted modes of attack have failed.

MERCURY ELIMINATION IN BICHLORIDE POISONING.

VOGEL and LEE in the *Medical Record* of January 8, 1916, state that:

1. The elimination of mercury in cases of acute bichloride poisoning may continue from periods of time ranging from a week to several months, and treatment should be continued until it has been shown that elimination of the drug is ceasing. The excretion usually continues longest from the bowel, and systematic flushing of the large intestine should always be carried out, but the gastric mucosa and the skin are also important as channels of elimination and should be utilized in order to spare the renal epithelium.

2. A considerable leucocytosis with an absolute and relative increase in the polynuclear cells is practically always present.

HYPOTHYROIDISM.

In *Northwest Medicine* for January, 1916, BROWN points out that true myxedema is a rare disease, but mild thyroid deficiency is very common, especially in the Puget Sound country, as shown by the large number of compensatory goitres one sees daily. The diagnosis of myxedema is easy, but milder deficiencies, causing, however, serious breaks in health, are very much more common than one would suppose.

As a general guide one should be suspicious of thyroid insufficiency on the following objective symptoms:

1. Obesity with pasty, anemic appearance, especially in children and in young adults.

2. A dry skin and scanty perspiration even on exertion. The skin is hard, board-like, and does not pit on pressure.

3. Brittle hair and finger-nails. The hair is scanty. The hair of the outer third of the eyebrow is often absent.

4. The heart action is as a rule slow and blood-pressure is sometimes quite low. A high blood-pressure is, however, not uncommon in cases of long standing.

5. Albuminuria and scanty urine with high specific gravity but low urea content is quite common.

6. Scanty, irregular, and suppressed or painful menstruation is a very common disorder, due to poor functioning of thyroid gland. The opposite, menorrhagia, is also common in obese young women.

7. Subjectively the symptoms are quite as varied. Enuresis nocturna in children is often due to hypothyroidism.

8. Muscular weakness, inability to sustain long and severe mental or physical effort, and sensitiveness to temperature changes are quite marked. Headaches, neuralgias, and especially the variety known as sick-headaches, are almost characteristic of this disorder. Psychical disturbances are not uncommon.

9. Backwardness in children, especially of walking and talking.

10. Enlarged tonsils and adenoids are not infrequently associated with hypothyroidism.

11. Skin eruptions of the eczema type are not uncommon and are exceedingly stubborn, unless the true cause is recognized.

12. The facial expression should be noted. The complexion is often of a pinkish-yellow hue, which Hertoghe considers of great value in making a diagnosis.

COMMON AFFECTIONS OF THE EYE.

In the *New York Medical Journal* of January 22, 1916, RISLEY says that one of the commonly occurring forms of disease with which we meet is phlyctenular ophthalmia, usually occurring in early childhood. The differential diagnosis is important since it may be mistaken for the catarrhal types of conjunctival disease, from which it differs widely as to symptoms, etiology, and the treatment required. It is differentiated from catarrhal conjunctivitis by the nature of the discharge and by the appearance of the conjunctiva. In infectious catarrh that membrane rapidly becomes opaque, red, and velvety, and the discharge is purulent or mucopurulent; there is very little or no photophobia or pain. In phlyctenular disease, on the other hand, the conjunctiva may be somewhat edematous, but remains transparent, and is often covered profusely with isolated elevated points or phlyctenulæ; or there may be, and usually is, a chain of larger phlyctenulæ along the limbus of the cornea, or the cornea itself may have one or more of these phlyctenulæ on its surface with or without a leash of vessels approaching it from the corneal limbus. The mucous membranes covering the soft palate and arches are also covered with phlyctenulæ, suggesting the systemic character of the disease. There is distressing photophobia, and profuse discharge of tears with excess of mucus floating in them. Pain is not a marked feature. The cases of phlyctenular disease, for the most part, belong to two distinct types, differentiated by their etiology. The older writers classified this disease as scrofulous or strumous ophthalmia.

In one group of cases the disease is habitually associated with, if not absolutely dependent upon, alimentary disturbance. The eye trouble may be regarded as a local expression of a general toxemia, the origin of which is in the alimentary canal. They are rebellious to all local treatment, but recover rapidly under alkaline washes, atropine, and dusting with calomel or bismuth powder, as soon as the digestive troubles are relieved by suitable treatment and a wisely regulated diet and general regimen.

Another group, which to the casual observer may, so far as local expression is concerned, seem in all respects similar, are nevertheless essentially different. Notwithstanding all the above suggested treatment they do not tend to recover, but to grow worse. The phlyctenulæ become open ulcers along the border of the cornea, there are gray isolated nests of opacity on the cornea, or on the membrane of Decimet, especially at the angle of the anterior chamber; the appetite is precarious, the child is pale, ill nourished, and the lymphatics are enlarged. Under corrected regimen, life in the country, iodide of iron and arsenic, cod-liver oil, etc., they make partial recovery, but soon relapse. These cases form a numerous group, and we now know they are due to tuberculous infection and tend to permanent recovery only under treatment addressed to relief from the specific infection.

Foreign bodies lodged in the cornea, simple as they may seem, are fraught with peril. The eye should first be flushed with a sterile unirritating wash, followed by a few drops of a sterile cocaine or holocaine solution, and the foreign body removed. This can often be done by a small pledget of cotton wrapped tightly on the fine point of a steel probe, slight lateral pressure being sufficient to dislodge the foreign body, when the eye should again be flushed with a suitable wash. When too firmly embedded for removal by this simple procedure, a small steel spud, or the point of a secondary cataract knife, may be cautiously placed under the foreign substance to lift it from its bed. But the possibility of infection, either from the foreign substance being impure, or by the contents of the conjunctival sac, which is rarely free from microörganisms, should always be borne in mind and carefully guarded against. If the patient is restless, or the foreign body is deeply embedded in the firm tissue of the cornea, it is not always possible to avoid the destruction of a considerable area of

corneal epithelium. Under these conditions it is often wise, after thorough flushing of the denuded surface, to apply a bandage firmly over the closed lids. This prevents the movement of the lids over the uncovered surface and exposed corneal nerves and so avoids discomfort for the patient, is security against infection, and gives opportunity for rapid replacement or repair of epithelium over the denuded area. If, in spite of these precautions, infection supervenes and corneal ulceration occurs, vigorous treatment should be begun at once. Judicious cauterization is the surest method of arresting its advance. Risley's own preference is for the well-controlled application of trichloracetic acid. A convenient and safe method is to dip the fine point of an orange-wood stick into a saturated solution of the acid and apply it lightly to the ulcer, which should be freed from moisture by absorbent cotton to prevent diffusion of the acid to the surrounding corneal surface. The previous instillation of a few drops of a two-per-cent holocaine solution makes the procedure painless.

SIMPLE GUIDES FOR THE ARTIFICIAL FEEDING OF INFANTS.

The *New York Medical Journal* of January 1, 1916, contains an article by EDELMAN in which he says that the quantities of the various elements to be used are as follows:

Proteins. Allen and Grulee have shown that the amount of protein contained in one ounce of milk is required to each pound of weight of the infant in twenty-four hours to maintain a nitrogen equilibrium (that is, no gain), and in order that the infant may build up sufficient nitrogen in the tissues, the proteins must be one and a half ounces of milk for each pound in twenty-four hours. That is, an infant weighing ten pounds requires ten ounces of milk in twenty-four hours to maintain a nitrogen equilibrium or keep its weight, and fifteen ounces to store up nitrogen or make a gain.

Fat. The same is true of fat; it requires one and a half ounces of milk in twenty-four hours to the pound—that is, the infant, in order to gain, must have the fat contained in one and a half ounces of milk for every pound of its weight in twenty-four hours.

Sugar. An infant weighing below ten pounds requires one ounce of sugar in twenty-four hours. An infant weighing above ten pounds requires one and a half ounces of sugar in twenty-four hours. Edelman never gives more than two ounces in twenty-four hours. When giving sugar for the first time, or after any nutritional disturbance, he never gives the required amount, but he starts with a teaspoonful and increases every day, or every other day, until he reaches the required amount; being guided by the infant's tolerance and the stools.

The foregoing guides give to the physician a simple method of using the various elements. It should be used as a barrier. To limit the formula as a whole, Edelman uses the caloric method. A calorie is the amount of heat required to raise the temperature of one kilo (2½ pounds) of water from zero to 1° C. It is a heat unit and is used as expressing a food value. With it we know exactly how much food to furnish the infant in twenty-four hours, with reference to its requirements and weight. But in order to ascertain the required calories, it is necessary to divide infants into three classes:

Class 1—Fat baby over five months, or an average baby at any age, requires 40 to 45 calories per pound in twenty-four hours.

Class 2—Average baby under four or five months, or a moderately thin baby at any age, requires 50 to 55 calories per pound in twenty-four hours.

Class 3—An emaciated baby at any age requires 60 to 65 calories per pound in twenty-four hours.

Bearing these three classes in mind, it is only necessary, when we see the infant, to place it in one of the classes. This can readily be done by inspection, palpation, and weighing of the infant. It is a very simple method to tell if a baby is normal, thin, or emaciated.

It may be asked, Why does an emaciated baby require more calories than a fat baby?

1. An emaciated baby cries and frets more, and uses more calories than a fat baby.

2. The amount of heat produced is in proportion to body surface—that is, the greater the skin surface, the more the heat produced. The skin surface of fat babies is the same as that of emaciated babies, therefore they produce the same amount of heat. We can readily see that the emaciated baby requires more calories to make up that heat, because its weight is less.

In order to make the formula according to the caloric method, it is necessary to know that one ounce of four-per-cent milk equals twenty calories, and one ounce of sugar by weight equals 120 calories.

As to the number of feedings in twenty-four hours, either two-, three-, or four-hour intervals are used. Edelman uses the three-hour interval in all babies who are not premature, and in the latter he uses a two-hour interval. If the three-hour interval is used, he gives food at 6 and 9 A.M. and 12 M., and at 3, 6, and 9 P.M., and again at 2 A.M., until six months of age. If the two-hour interval is used, he has ten feedings. The four-hour interval, he must admit, he has not as yet given a thorough trial, for in dispensary practice it is impossible to have the mothers carry it out.

The quantity to give an infant at each feeding is determined by the following rule: Give one or two ounces more at each feeding than the number of months in the baby's age; never less than three ounces, and never more than eight ounces. Experiments have shown that an infant one week old can take three ounces every three hours, with good results, and Edelman's experience bears it out. The reason is that the liquid portion of the milk passes into the intestine immediately, and the solid portion of the milk takes from three to three and a half hours to pass through. The liquid portion makes up about three-quarters of the milk and the solid portion makes up the other quarter.

The rule for the diluent of the milk. That depends upon the number of feedings and the amount given at each feeding. Example: Baby three months old; the number of feedings according to the rule would be seven; amount to give at each feeding would be, according to the rule, from four to five ounces. We then multiply seven feedings times five ounces and we get thirty-five ounces of food for twenty-four hours. Therefore that infant requires thirty-five ounces of food in the twenty-four hours. If we now deduct the amount of milk we desire to use, we get the quantity of the diluent to be used. Having learned these guides, we can now proceed to feed our baby.

Example: Baby A., six months old, weighs 15 pounds, stools normal. This baby belongs to the first class, forty to forty-five calories, and according to the rules requires six feedings (after five months); no night feeding. The amount at each feeding in this baby would be seven to eight ounces (one to two ounces more than the baby's age).

Protein and fat requirements would be fifteen pounds (the baby's weight) multiplied by one and a half ounces equals twenty-three ounces of milk required. The sugar required is one and a half ounces for the twenty-four hours (baby weighing over ten pounds). Total amount of food for the twenty-four hours would be six feedings, and eight ounces to each feeding; six times eight equals forty-eight ounces of food for twenty-four hours, including milk and diluent.

The weight of the baby is fifteen pounds. The calories necessary for each pound are forty to forty-five. The child requires fifteen times forty-five calories, equals 675 calories; this child requires food for twenty-four hours amounting to 675 calories. From this amount we must deduct the calories for the sugar to ascertain the amount of milk and diluent required, one and a half ounces of sugar times 120 calories per ounce of sugar equals 180 calories. Subtract 180 from 675 equals 495 calories to be made from the milk. We divide 495 by twenty (because there are

twenty calories to each ounce of milk), equals about twenty-four ounces. This entire formula of forty-eight ounces requires twenty-four ounces of milk, and therefore leaves twenty-four ounces for the diluent (in this case boiled water) and one and a half ounces of sugar (here cane-sugar because this is a normal baby). Our formula for this baby would consist of twenty-four ounces whole milk, twenty-four ounces of water (boiled for three minutes), and one and a half ounces of cane-sugar, to be divided into six bottles of eight ounces each, to be given at 6 and 9 A.M. and 12 M., and 3, 6, and 9 P.M.

This, to Edelman's mind, is the simplest and most successful method of artificial infant feeding we have to-day. For the method he is indebted to his chief, Dr. R. Dennet.

PHYSIOLOGY OF THE PITUITARY GLAND AND THE ACTIONS OF ITS EXTRACTS.

In the *Lancet-Clinic* of January 8, 1916, CADWALLADER reminds us that pituitrin, which is obtained from the pituitary gland, is being very generally used, and especially in obstetrics. As it has never been formally presented to the Cincinnati Obstetrical Society, he thought a brief review of its action and use might prove of benefit. Upon inquiry among a number of general practitioners, he found that they are using it rather promiscuously and citing no bad results, but much aid, in their obstetrical cases. From one of his fellow doctors, for whom Cadwallader has much regard for his deductions and ability, he begs leave to quote the following letter, which, upon request, was given to him:

"I have used pituitrin over a period of five years and consider it a very valuable aid in my obstetrical work. My forceps cases have been reduced 75 per cent since I have used it. I have never had any fatalities in the use of it, but have noticed that the babies are at times cyanosed. While this might seem a drawback to the use of the drug, we must remember that this condition with possible bruises and tears is liable to occur with the use of forceps. I had one patient on whom I had used this preparation develop spasms immediately after delivery of the placenta. No albumin in the urine, but the spasm lasted about ten minutes. I delivered her of a child once before and once afterwards without the use of pituitrin, and patient was absolutely free from any pathological symptoms."

THE TREATMENT OF NEPHRITIS.

In the *Boston Medical and Surgical Journal* of January 20, 1916, PHIPPS reaches these conclusions:

1. Any rigorous system of diet may be (but should not be) so strict or continued so long as to make it distinctly harmful to the individual case.

2. More freedom in the allowance of protein than is recommended in the "text-book" nephritic diet may be of apparently great advantage in the individual case.

3. Thyroid extract has, perhaps, a great value in the treatment of nephritis, one of the commonest and, at the same time, one of our most hopeless diseases.

4. If given carefully, the administration of the drug is safe.

5. Thyroid medication in nephritis should receive more attention than has heretofore been accorded it.

THE TREATMENT OF ALOPECIA AREATA.

In the *Journal of the Missouri State Medical Association* for January, 1916, SUTTON tells us that of the various constitutional remedies that have been recommended, none is specific. Arsenic, iron, cod-liver oil, and the similar tonics are indicated, should the patient's general health be below par. Believing, as he does, that the disorder is essentially due to ganglionic injury, following trauma or infection, he has, during the past four years, prescribed hexamethylenamine as a routine measure in all his alopecia areata cases. The dosage varies, but the majority of patients can comfortably take from 5 to 10 grains (0.3 to

0.6 gm.) in plentiful amounts of water, after each meal for considerable periods of time. If there is any resulting vesical irritation the remedy should be withdrawn for a few days and then its use gradually resumed. Sutton believes the drug exerts a favorable influence in the majority of instances. At any rate, his results have been far more satisfactory since its adoption than before. Locally, stimulating applications are the most valuable. The majority of those recommended are antiseptic as well as irritating, but in the selection of a remedy its bactericidal properties are of secondary importance. The list includes a wide variety of drugs—tar, mercuric chloride or iodide, chrysarobin, beta-naphthol, croton oil, aqua ammonia, tincture of cantharides, trikresol, and phenol.

Of these various agents, phenol (95 per cent), as originally recommended by Bulkley, has proved the most efficient in Sutton's hands. The remedy may be applied full strength to bald patches on the scalp and eyebrows, but should be diluted one-half with glycerin when treating lesions on the face. It may be painted on twice weekly, care being taken to avoid covering too large an area, not more than 50 square centimeters at one time. He prefers to apply only a thin film, and allow it to remain on the skin, but many authorities recommend that the phenol be immediately followed by liberal applications of ethyl alcohol.

In addition to this local irritant, he generally prescribes a stimulating tonic, such as mercuric chloride dissolved in alcohol, mainly for the purpose of stimulating the growth of the hair and eradicating any lesions of seborrheic dermatitis that may be present. The following mixture has proved very satisfactory in his hands:

Mercuric chloride, gr. 1/6;
Chloral hydrate, drachm ij;
Spirits of formic acid, drachm iv;
Castor oil, min. v;
Alcohol (80 per cent), q.s. ounce vj;
Oil of bergamot to perfume.

M. et sig.: Shake, and apply to scalp at night.

An occasional massage is helpful, principally as a circulatory stimulant. The main dependence, however, is to be placed on the hexamethylenamine and phenol. If these are employed methodically and persistently, recovery will result in the majority of instances.

EPISIOTOMY.

In the *Boston Medical and Surgical Journal* of December 23, 1915, WILLIAMS in an article dealing with this topic reaches these conclusions:

1. Episiotomy is a procedure of definite value.

2. Properly used, it should practically eliminate complete laceration of the perineum from gynecology.

3. It should not be performed except to prevent a complete tear, because incomplete perineal tears heal as well as the episiotomy wound and are less difficult to suture.

4. Complete lacerations of the perineum are especially to be feared in: (*a*) Contractions of the inferior strait. (*b*) Rigid perineum, as in late primigravidæ. (*c*) Short perineum. (*d*) Unusual size of fetal head. (*e*) Aftercoming head in breech presentation. (*f*) Face presentations.

NOTES ON THE TREATMENT OF DIARRHEA AND DYSENTERY.

In the *Journal of the Royal Army Medical Corps* for November, 1915, BALFOUR gives this advice:

1. *Diarrhea.* The following remarks apply not only to simple irritative diarrhea, but to the early diarrheal stages of all forms of dysentery.

A case seen right at the beginning should at once be given one ounce of castor oil. If colic is present ten drops of tincture of opium should be added to the oil. This treatment alone, with rest, warmth, and suitable dietary, will often check the condition. It may frequently with advantage be followed by one-drachm doses of castor oil in an emulsion given every four or six hours for twenty-four hours. At the same time, having regard to the difficulties in coming to an exact bacteriological diag-

nosis, emetine should be administered intramuscularly or intracellularly from the outset in the dose already recommended by Sir Ronald Ross, namely, two-thirds of a grain once or twice a day.

In severe cases which show every sign (colic, tenesmus, rise of temperature) of passing on into a true dysentery there should be no hesitation in giving a large dose of emetine. As much as 2 or even 3 grains daily, say in ½-grain doses every four hours, may be administered so long as it is tolerated by the patient. The smaller dose will, however, generally suffice. Intolerance is usually shown by nausea and a tendency to collapse. Salivation may also be present. So far as is at present known there is little or no risk of a cumulative effect.

If the castor oil fails after fair trial it is well to have immediate recourse to the salines. The following prescription is useful:

Sodii sulphat., gr. lx;
Acid. sulph. aromat., min. xv;
Tinct. zingiberi, min. vijss;
Aq. menth. pip., oz. j.

It may be given every two, three, or four hours, according to the severity of the case, and should be continued until the stools become watery. Sodium sulphate is on the whole preferable to the magnesium salt.

Note.—It would seem that calomel has not been so successful in the treatment of diarrhea amongst the troops as the measures above indicated. Opium may be necessary if there is much griping, but it is better avoided after the initial dose given along with the castor oil.

2. *Amebic Dysentery.* (1) Acute. When the bacteriologist pronounces the case to be due to Entamœba histolytica infection, or when the symptoms (character of stools, course of the temperature, etc.) point to the entamebæ being the cause, it is necessary to continue the emetine treatment energetically.

A dose of one grain given once or at the most twice a day, and preferably by the needle deep into the outer portion of the forearm, after careful skin sterilization is usually ample, but it must be remembered that emetine acts by killing the causative entamebæ and preventing the formation of their infective cysts, and that emetine alone will not cure the ulcerative colitis which is speedily established in a case of amebic dysentery, nor has it any effect upon the secondary septic absorption which so often occurs. Hence to rely wholly on the emetine treatment is in many cases a mistake unless, indeed, it is instituted at the commencement of the illness, when it usually suffices.

Local treatment of the bowel is, therefore, indicated in all save mild and trivial attacks. For this purpose the saline mixture mentioned under diarrhea should be continued four-hourly at first, and if necessary pressed; while washing out the lower bowel night and morning with a plain warm saline solution, administered by means of a douche can, is very sound and often affords great relief. The saline treatment also washes away amebic cysts, and by its scouring action on the intestinal epithelium may possibly enable the emetine to act on deep-seated cyst-producing entamebæ. Care should be taken that the nozzle used is sterilized after use, as infection has been conveyed by this means. Later on, when blood has disappeared from the stools but mucus still persists, daily enemata of tannin and quinine should be substituted. The lavage must be performed carefully and slowly, and continued until the intestinal effluent returns almost clear.

Dissolve 150 grains of tannin and 15 grains of quinine hydrochloride in a liter (1¾ pints) of warm water. If painful, half-strength may be employed.

Tannin alone, 0.5 to 1.0 per cent, may be used. Calcium permanganate, 6 grains or more to the pint, is an alternative solution. A sedative enema which may be tried with advantage consists of bismuth 2 drachms, tincture of opium 30 minims, and thin starch 2 ounces. When it can be managed an ounce of linseed soaked for several hours in 2 pints of warm water makes a soothing injection. A suppository of cocaine and morphine will frequently facili-

tate the administration of enemata and may also benefit spasms and tenesmus.

Sir James Crichton Browne has suggested that hypochlorous acid in the form of injections of "eusol" is worthy of trial combined with saline lavage. This will soon be generally available, and there are good grounds for adopting the suggestion, though such a line of treatment is perhaps more adapted for chronic cases.

In severe amebic dysentery emetine should be given intravenously. As much as one and a half grains can be injected daily dissolved in ten cubic centimeters of saline. Emetine may also be given by the mouth in keratin- or salol-coated pills taken at night on an empty stomach, but it is not so good when thus administered. In all cases diminish the emetine as the case improves. Thus, as a rule, the daily dose can soon be reduced to half a grain. It is well to carry on the treatment for a week or ten days, then to give a week's rest, and to start again if examination of the stools shows that a further continuance of the treatment is necessary. Another method is to give the daily dose for a week, and throughout the second week to inject the emetine on alternate days. Save for the purpose of getting rid of cysts it is rarely, if ever, necessary to continue the costly emetine treatment beyond a second course. If emetine is going to do good its beneficial action is quickly apparent. It is well to remember that emetine itself may, even in medicinal doses, produce diarrhea, and when used in the form of suppositories is said to have produced bloody stools. Hence, one should always ask oneself if a persistent diarrhea in a dysentery case taking emetine may not be due to the drug and not to the disease. Failing emetine, recourse must be had to the old ipecacuanha treatment, which Sandwith describes as follows:

"The patient is starved for four hours, say from 5 P.M.; at 8.45 P.M. a mustard plaster is applied to the epigastrium, the pillows are removed from beneath the patient's head, and 15 minims of laudanum in water are given to him. At 9 P.M. he has one dose of 30 grains of ipecacuanha, and to prevent vomiting he is kept absolutely at rest, the nurse being ordered to wipe his lips to prevent his swallowing saliva for at least three hours, when he is allowed a small drink. The next night, with similar precautions, he is given 25 grains of the drug, preceded by ten drops of laudanum. On the third night he takes 20 grains after five drops of laudanum. After this opium is no longer required, and the ipecacuanha is gradually reduced to 5 grains and kept there till the course has lasted a fortnight, when the patient will have taken altogether 145 grains. The patients submit willingly to possible vomiting and rigid rest and make up by day for rather sleepless nights."

The form of ipecacuanha containing emetine is, of course, indicated. It is useful to add one part of tannin to three of ipecacuanha. The dose may be divided amongst four cachets, which are taken at the same time and continued daily for three days, then being gradually diminished.

During convalescence salicylate of bismuth should be employed if diarrhea persists. Some employ bismuth in large doses either as the subnitrate or salicylate along with emetine throughout the illness, but so far as recent experience goes the saline treatment seems to be preferable.

In all severe cases the tendency to heart failure should be remembered, and the value of hypodermic injections of camphor in this condition recalled.

(2) Chronic. Here local treatment is most useful. "Eusol" injections may be tried. So may large enemata of copper sulphate 1 in 1000, or nitrate of silver with opium and starch. It does not appear necessary to enter fully into this question as but little that is new or specially valuable has lately been advocated.

Note.—In every case of severe advanced amebic dysentery the stools should, whenever possible, be carefully washed and searched for sloughs, as their presence or absence forms a most useful guide to the course of the disease and may indicate the need of caution in giving injections by the bowel.

3. *Bacillary Dysentery.* (1) Acute. When the bacteriologist reports a case to be due to Bacillus dysenteriæ, or when the course of the disease (character of stools, course of temperature, etc.) points to invasion by a bacillus of the dysentery group, two lines of treatment have to be considered—that by specific polyvalent serum and that by salines.

Serum is now available, and there can be no doubt that in many cases it is of great value. The sooner it is given the better. The dose is twenty cubic centimeters by subcutaneous injection, and as a rule this is sufficient, but if necessary as much as sixty cubic centimeters may be given at the outset, or the above dose may be repeated.

If salines are employed the sodium sulphate mixture mentioned under amebic dysentery will be found to act well. As a rule it should be combined with simple lavage of the lower bowel.

In very bad cases drained by incessant evacuations, intravenous injection of saline on the lines introduced by Rogers for cholera will often save life, but it must be resorted to in good time. The special cholera outfit in two separate cases is now available and should be at hand for treating such cases of dysentery. Full directions are supplied with the outfit. An emergency injection consists of common salt 60 grains, carbonate of soda 60 grains, boiled water 1 quart. Give one to three quarts at a temperature of 100° F., carefully watching the effect. The danger of heart failure even at an early stage must be borne in mind.

(2) Chronic. Local treatment similar to that employed in chronic amebic dysentery is indicated, and, if available, the organic silver compounds, albargin (silver gelatose) 1 in 500, or protargol 1 in 100, should be accorded a trial. Here, again, "eusol" may find a useful field.

Enemata of olive oil sometimes prove very useful in this form of dysentery.

Note.—In cases of doubtful etiology there should be no hesitation in employing a combined therapy of emetine and polyvalent serum. In both forms of dysentery colic is benefited by turpentine stupes to the abdomen, while hemorrhage may be controlled by morphia or adrenalin hypodermically, calcium chloride or lactate by the mouth, or oil of turpentine in capsules.

4. *Flagellate Dysentery.* The only form which need here be considered at length is that due to Trichomonas hominis, for this is the only form of flagellate diarrhea or dysentery which has hitherto, so far as is known, been recognized amongst cases occurring in the Mediterranean Expeditionary Force. It cannot be recognized clinically, but may be suspected in cases of persistent diarrhea with bright yellow stools. In any case, the other forms due to Lamblia and Tetramitus cannot be very satisfactorily treated.

Trichomoniasis, however, though troublesome, can be dealt with as follows: In the early stages give an enema of an aqueous solution of iodine 1 in 1000. The water used need not be boiled as the iodine sterilizes it. Administer the injection slowly every evening for three consecutive days, giving one liter at a time. The iodine enema should be preceded by one of boiled water.

If the parasites persist a tablespoonful of the following mixture should be given every two hours for the first three days:

℞ Infus. cinchonæ (1 in 50, not acid), ounce ijss:
Ext. cinchonæ, drachm iij;
Tinct. cinnamomi, drachm v;
Syrup. opii (0.5 ext. in 1000), drachm iij;
Tinct. camph. co., drachm j;
Olei terebinth., m. xlviij;
with
Gummi acaciæ, drachm ss;
Aq. flor. aurant., drachm ss;
Aq. dest., drachm v;
Syrupi, drachm ij.

In addition the following enemata night and morning are indicated:

(a) 3½ pints of decoction of eucalyptus.
(b) 2 ounces of boiling water, yolk of an egg.
10 minims of laudanum.
15 minims of essence of turpentine.

This is Escomel's treatment, the essential of which is the exhibition of turpentine. It may be noted that for lambliasis the same author recommended calomel and aromatic castor oil.

SALVARSAN IN PRIMARY SYPHILIS.

In the *New York Medical Journal* of January 1, 1916, UHLE and MACKINNEY reach these conclusions as the result of clinical experience:

1. The earliest possible diagnosis of syphilis depends upon the demonstration of Treponema pallidum in the expressed serum of a suspected sore.

2. This examination is best made with the dark field illumination microscope.

3. The Wassermann reaction is of value in the diagnosis, as a positive reaction means the onset of systemic syphilis, while a negative reaction for practical purposes means a local infection only.

4. Experience teaches them that, when energetic salvarsan or neosalvarsan treatment is introduced before the advent of a positive Wassermann reaction, a radical cure is the rule.

5. After the Wassermann reaction is once positive, such uniformly good results cannot be expected.

6. When possible, excision of the chancre is a valuable addition to treatment.

RHEUMATISM AND SULPHUR.

We have recently received from Sir Lauder Brunton an extract of a paper he contributed to the *Lancet* of February 6, 1915. He says:

"In some cases, at least, of rheumatism, sulphur is an exceedingly useful antirheumatic. Many years ago, with the conceit born of ignorance, I considered the statement that powdered sulphur worn inside the stocking is a cure for rheumatism to be only an old wives' fable. I learned my mistake from a case which occurred in my own practice. I was seeing at fairly regular intervals for albuminuria a thoroughly skilled scientific chemist. One day the chemist asked me to prescribe for his wife, who was suffering from rheumatic pains in her hands which prevented her from sewing. This was to her a very serious matter, as she added much to their joint income by embroidering altar cloths and the like. I gave a prescription as requested, and at the next interview I asked the chemist how his wife was. 'Oh!' he said, 'she is quite well.' I was much pleased at this, and was taking the credit of the cure to myself, when the chemist told me that the medicine which I had given her had done her no good at all, but a friend had told her to powder the inside of her stockings with sulphur and wear them all night. In a short time this completely cured her, and her husband said the sulphur must have been absorbed through the skin of her legs, passed through her body, and been excreted by the skin of her arms, because her silver bangles became black. This remedy is simple, cheap, and easily applied, and might be useful in the case of the British soldiers. I hardly think it could do any harm whatever, though I have no experience of the effect of sulphur continuously applied to the skin for some weeks together, but, at any rate, I think it is worth a trial."

RECTAL AS A SUBSTITUTE FOR VAGINAL EXAMINATIONS IN LABOR.

HOLMES writes in the *Journal of the American Medical Association* of December 25, 1915, as follows:

1. The discovery of the possibilities of rectal examination in labor by Kroenig and Ries is one of the most important contributions to modern obstetric medicine of the last generation.

2. There must be a complete revision of the chapter on pelvic examination in obstetric text-books. Adequate presentation of the value of rectal examination must be stated. Vaginal examinations should be made subordinate to rectal touch.

3. While, at the present time, rectal examination does not give us the means of measuring pelvic size, it is of great value in estimating the factors situated in the posterior half of the bony pelvis.

4. In almost every direction, under appropriate conditions, rectal examination is as definite as vaginal, if combined with abdominal palpation.

5. The ease or difficulty of rectal examinations is commensurate to the ease

or difficulty which encompasses the vaginal ones, and is dependent on the same factors.

6. Rectal examination is an utterly innocuous precedure in labor, whereas vaginal examinations are always potential sources of infection to the woman.

7. Rectal examinations are peculiarly appropriate to those women who are to receive the test of labor in relatively contracted pelves when a Cæsarian section may possibly be needed.

8. Vaginal examinations should be made in labor only when, for some special reason, the rectal findings are indefinite or inconclusive.

9. The least that can be said of rectal examination is that it permits the conduct of normal labor with the essential elimination of vaginal examinations; a decided advance in the technique of the conduct of labor.

TREATMENT OF GASTRIC ULCER.

The *Official Bulletin of the Chicago Medical Society* of December 25, 1915, contains a summary of this subject by SMITHIES. He says that in considering the treatment of gastric ulcer the following fundamental facts should be remembered: (1) Gastric ulcer is usually a terminal phase of a systemic ailment, and is not a disease *sui generis*. Cure can be expected only after the removal of the underlying cause. (2) The primary cause is seldom due to alterations in gastric chemistry. (3) Changes in gastric chemistry are apparently secondary to existing ulceration. (4) Many gastric ulcers have a natural tendency to complete healing. The primary systemic fault should be searched for and eradicated. Foci of infection in the adenoids, about the teeth, or in the lymph-gland chains should be promptly removed. Intra-abdominal infections should also be eradicated. The removal of these germ centers is a fundamental step toward cure. Unless ulcers with much scar or causing gastric deformity are demonstrated to be luetic, medical measures promise little permanent relief. Frequently, so-called specific ulcer cures seem to bring about periodic stages of relief. Relief, however, does not mean cure. The disease often advances when under the most careful treatment. The danger of malignant change occurring in calloused ulcers should not be forgotten. It is agreed that calloused recurring ulcer in the pyloric half of the stomach should always be treated surgically. Excision should be done, when possible. If impracticable, then infolding, cautery puncture, with or without gastrojejunostomy, is best.

Cases to be treated medically should be carefully selected. The essential principles of medical treatment are: (1) Rest in bed, physical and mental. (2) Rest to the stomach itself. Avoidance of peristaltic waves. Irritating medicine should be avoided, as also gastric lavage and frequent local examinations. (3) The stomach should be kept nearly empty of food. The abstinence from food by mouth should continue for from three to seven days. The period is empirically determined. Paraffin wax may be chewed for fifteen minutes every two hours. Rectal feedings should be instituted: from 1000 to 1500 calories of nutrient mixture in twenty-four hours. A clyster containing alcohol, glucose, and normal salt solution is preferable. When mouth feeding is begun, small quantities of food should be frequently administered, to empty the stomach rapidly and keep it food-free for the longest time. This keeps down the hydrochloric or pepsin production to the minimum. Liquid carbohydrate mixtures are indicated. They call for the least amount of HCl and pepsin and impose the minimum of work upon the duodenum. The pylorus remains free from spasm and opens readily, and thus are avoided gastric stagnation and the accumulation of distressing acids. This limitation of acidity limits both the rate and strength of gastric peristalsis.

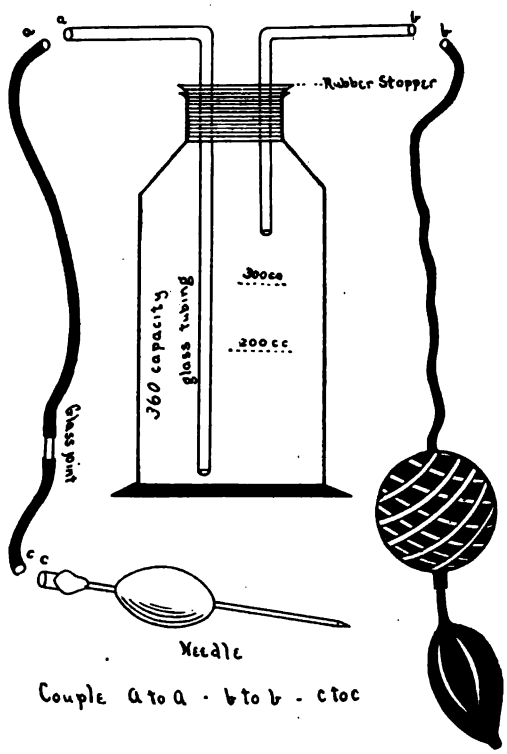
By observing the foregoing, large quantities of alkalies are usually unnecessary, as they tend to create pernicious increase of gastric acid and mucus. They also increase the alkalinity of the blood and stimulate the HCl secretion. Just enough alkali should be given to permit the duodenal contents to

be readily neutralized in order to rapidly empty the stomach through a relaxed pylorus. The excess of alkali acts as a foreign irritant.

A SALVARSAN APPARATUS.

DENNY states in the *Boston Medical and Surgical Journal* of December 23, 1915, that the accompanying sketch represents a useful and simple salvarsan apparatus which is much used in St. Paul, Minn.

It is reliable, practical, and simple; also



it is easily constructed by any one at small cost.

Take a wide-mouthed bottle of 360-Cc. capacity, fit it with a rubber stopper perforated for two glass tubes as you would a wash bottle.

Take 26 inches of rubber tubing to fit the glass tubes, cut it 18 inches from the end, and make a glass joint with the smaller cut end of the tube.

The long glass tube reaches to the bottom of the bottle and is to be connected with the rubber tubing, into the end of which the needle coupling is inserted.

The short glass tube is connected with a double bulb, such as is used with a thermocautery.

It is now ready for use after the salvarsan solution is poured in the bottle.

The stopper is fastened down by a wire or strips of plaster over the cork and around the neck of the bottle.

After the needle is inserted into the vein and the coupling is made, a few squeezes of the bulb are all that is necessary to force it slowly and steadily into the vein.

Care is taken not to allow air to enter the vein at the end of the injection.

The sketch renders more details unnecessary.

THE NUTRITIVE VALUE OF BOILED MILK.

The *American Journal of Diseases of Children* for January, 1916, contains a report by DANIELS and STUESSY on this subject. They claim that their results point to the conclusion that milk heated to the boiling temperature or thereabouts is an inadequate food. Rats fed on boiled milk grew to about half their normal size. Although they have been able to keep these experimental animals for many months on boiled milk, in no case have they got reproductions, nor have any of their animals reached the normal weight for adult rats.

Milk which is kept at the boiling temperature for forty-five minutes is no less efficient as a food than milk boiled for much shorter periods—ten minutes or one minute. The chemical changes which make milk an inadequate food are brought about at the boiling temperature or thereabouts. The value of pasteurized milk as a food, therefore, will depend on the temperature to which it is heated during the pasteurization process. Heating milk to a higher temperature than boiling (114° C.) makes it even less valuable as a food.

Although boiled cow's milk is an inadequate food for rats, it is apparently better borne than raw or pasteurized cow's milk, for they have been unable to raise young rats on either exclusively. However, rats fed both raw and pasteurized milk to which small amounts of meat extract were added

grew at the normal rate. The explanation of this lies, possibly, in the fact that the meat extract caused an increase in the digestive secretions, thus making the milk more available.

The advantage of using raw milk for infant feeding is obvious. When babies are unable to digest raw cow's milk, however, or there is danger that the milk may be contaminated, they believe that the pediatrist is justified in using boiled milk. When this is given, the mixture should have a higher protein content than when raw milk is used.

[Apparently these experiments do not prove that boiled milk is useless any more than they prove that raw milk is useless.—ED.]

A PRELIMINARY NOTE ON CHRONIC POISONING BY EMETINE.

The *British Medical Journal* of December 18, 1915, contains an article which has this title written by DALE. He says he was asked his opinion as to the possibility of producing symptoms of poisoning by the long-continued administration of emetine in individual harmless doses. Those who have had experience of the treatment of amebic dysentery with emetine have evidently been alive to the possibility of such a cumulative action. Dr. Low, for example, in a recent article in the *British Medical Journal* (Nov. 13, p. 715), mentions diarrhea, secondarily arising during treatment with emetine, as possibly caused by the alkaloid, and suggests that an unduly continued use of the latter in too high a dosage may eventually produce symptoms of intoxication. But there seems to be no certainty on the point, and little hope of attaining such by clinical observation alone, owing to the difficulty of deciding whether local effects on the alimentary canal, or more general effects of toxemia, are to be attributed to emetine, or to the condition which has led to its being administered.

On the other hand Dale failed to discover any record of direct uncomplicated experiment on the point. It was evidently desirable, therefore, that the matter should be put to the test of experiment on healthy animals. The investigation is still in its initial stage, but the indications that a cumulative action can be produced are already so positive that it seems desirable to make mention of the results even at this early period, in view of the practical importance of their implications.

At present Dale has made experiments only on a small number of cats and rabbits. The question as to what doses, in either of these species, can be regarded as physiologically equivalent to the doses normally employed in human therapeutics can only be answered by further experiment. Up to the present he has used a dosage which, in proportion to the weight of the subject, would be regarded as rather high for continued administration to man. If we take 65 kg. as the weight of an average man, a dose of one grain for such a patient is about 1 mg. per kilogramme. So that 5 mg. for a cat weighing 3 kg. corresponds to rather more than 1½ grains for the average man. This is the order of dosage with which he has experimented up to the present—individual hypodermic injections of 5 mg., or occasionally 10 mg., for animals of 2.5 to 3.5 kg. Such a dose, given once only, has no perceptible action of any kind on the animal, and it may be repeated daily, up to a point, without obvious effect. There is considerable individual variation in respect of the number of such daily injections which can be tolerated with full maintenance of health. It has been as few as three in one case, and as many as ten in another. But in all the experiments which hitherto have been carried on as long as a fortnight, symptoms of intoxication have sooner or later appeared, have become rapidly intensified with persistence in the daily injections, and have terminated fatally. In rabbits a profuse diarrhea, attended with rapid emaciation, has been the most prominent effect. In cats this symptom has been seen, but is apparently of secondary importance, and may be absent altogether; the most prominent effect in this species is pronounced lethargy and somnolence, deepening to a terminal coma. The pathological

examination of the material has barely been begun. It is only possible to mention, therefore, with all reserve, that there is evidence of damage to the liver and kidneys, in addition to the expected signs of intestinal irritation.

Dale is aware that the dosage above indicated is somewhat, though not greatly, in excess of that which is habitually employed in human treatment. He deliberately so chose it in order to obtain evidence with a minimum delay on the important question whether a repetition of individually subtoxic doses of emetine can produce a cumulative poisoning of serious importance. The answer is already very definitely affirmed. He is fully conscious also of the care needed in applying results, obtained with experiments on different species, to human therapeutics. But with all allowance for differences in dosage and conditions, he cannot believe that these results are without significance in indicating a serious danger in pushing the administration of emetine beyond a certain point. His object is not to suggest any modification in the accepted dosage and rate of administration, but rather to reënforce, with the aid of direct evidence, the warning, which has already been sounded from other quarters, against the indiscriminate and unguarded use of emetine beyond the limits which expert observation has laid down for its employment with safety and benefit.

EFFECT OF MODERATE DOSES OF SOME OPIUM DERIVATIVES ON THE GASTROINTESTINAL TRACT OF MAN.

The *Journal of the American Medical Association* of December 25, 1915, contains an article in which PANCOAST and HOPKINS claim that the Roentgen examination is a valuable method of studying certain phases of drug effects on the gastrointestinal tract, especially motility, and the knowledge it furnishes can be gained better by this method than by any other.

Their observations were made in a series of eleven cases given morphine and in one heroin habitué. While they have been able to duplicate the phenomena observed by others, with one exception, there was a decided lack of uniformity in the effects produced in different individuals, in connection with both stomach and bowel.

There is no distinct uniformity in connection with dosage. Small doses in some may produce more marked effects than much larger doses in others. Females appear to be more susceptible.

In the stomach a rather high spasmodic hour-glass contraction is observed rarely, but they have not seen this near the pylorus as described by others. In some instances the stomach may show no appreciable change from normal. In most cases there is more or less pyloric spasm, increased peristalsis, and a decided prolongation of the emptying time.

In the small intestine, morphine causes decreased motility almost uniformly, apparently as a result of a lack of propulsion and not of spasm. When marked, it is most noticeable in the upper small bowel.

The effect on the large bowel is very variable and probably of little consequence.

Oral administration produces practically the same effect as subcutaneous injections.

VINCENT'S ANGINA.

In the *Journal of Laryngology, Rhinology and Otology* for December, 1915, WINGRAVE states that experiments *in vitro* and *in vivo* conclusively show that trikresol and formalin are the most reliable antiseptics when dealing with spirochætæ, and may be used with full confidence. Iodine, silver nitrate, chromic acid, ferric chloride, and phenol, notwithstanding their popularity, are unhesitatingly condemned. Hydrogen peroxide, perborates, and permanganates, although useful as adjuvants, are not thorough in their action.

Trikresol, 5 per cent, in alcohol may be freely and frequently applied to the ulcer without any fear of toxic results, and diluted with water to 0.5 per cent may be used as a mouth douche. Formalin is best used as lysoform, either pure or diluted, in

the same way. A very pleasant addition to either is English oil of lavender, 0.5 per cent, to the alcoholic solution.

As an astringent zinc permanganate, one grain to one ounce of water, is preferable to all other permanganates.

THE COMBINATION OF LOCAL AND GENERAL ANESTHETICS AND THE USE OF ADRENALIN.

In the *Canadian Practitioner and Review* for January, 1916, WISHART says he wishes to register his protest against the increasing tendency to perform operations upon the nose and throat under general anesthesia. In adults it is seldom necessary to resect the nasal septum, or remove the tonsils, to say nothing of operations upon the turbinals or the ethmoid, except with local anesthesia. Any operator who wilfully yields to the desires of the patient, or thoughtlessly gets into a routine of using general anesthetics, except in rare and selected cases, exposes his patient to a needless risk, and, moreover, contributes to a weakening of the public conscience. The pain involved in the operations referred to is not greater than the pain endured in filling teeth, and Wishart has performed the radical mastoid more than once under local anesthesia.

Perfect ischemia and anesthesia may be obtained by carefully packing the nose with equal parts of a 10-per-cent solution of cocaine, and of a 1-to-1000 solution of adrenalin, one hour before operating, and the sense of shock may be abolished, as Crile has shown, by the use of morphia combined with atropine, and, in selected cases, with hyoscine.

If the operator prefers the injection method, he should use novocaine, ¼ per cent, with the addition of not more than 6 minims of 1:1000 solution of adrenalin to each drachm. The injection should be made about fifteen to thirty minutes before operation.

Whenever possible, a solution of novocaine should be selected instead of cocaine, as it has toxicity of one-tenth that of cocaine.

Deaths have occurred in Toronto, where local and general anesthesia were combined, but in the absence of post-mortem examination by trained pathologists, Wishart refused to allow the fact of this combination having been used to bear responsibility, nor has he seen a death when a highly-trained anesthetist was employed.

He believes that it is in the use of adrenalin that our peril lies. Adrenalin causes a diastolic fall after two minutes, which lasts for about one hour, and this is probably due to dilatation of the aortic orifices, with temporary regurgitation (Watson).

In an article upon the cardiac effect of adrenalin, by Levy, the author points out that adrenalin belongs to a group of substances styled Sympathomimetic, of which the action is limited to structures innervated by fibers of the sympathetic system.

The heart under chloroform is in an irritable condition, and this irritability is raised under light, and lowered under deep, anesthesia. If adrenalin be injected when the patient is still under light anesthesia, the ventricles begin to contract in a chaotic sequence of irregular beats, and presently the individual muscle bundles of the ventricles, which interlace in many directions, commence to contract independently, and as a consequence the beat is no longer coordinate, and the ventricles are said to be fibrillating. In cats, the injection into a vein of a half-minim of solution of adrenalin chloride will cause this ventricular fibrillation, which is generally permanent, and ends in death of the heart in asphyxia of its tissues. When full chloroform anesthesia is used, however, such as is obtained by a 2-per-cent proportion of vapor to the inhaled air, ventricular fibrillation does not occur.

Adrenalin, therefore, should never be injected during the course of a general anesthetic, unless it be perhaps in certain cases of shock, which Wishart believes occurs in connection with abdominal operations, and where the risk has to be taken, as a *dernier ressort.* He has frequently employed a solution of cocaine or of adrenalin locally, during the course of an operation where the

bleeding became a nuisance, without inducing any unfavorable symptoms. He would think it inadvisable, however, to spray either of these solutions upon the operating area. He is not afraid of using chloroform anesthesia where he has packed the nose previously, provided it be full and continuous. The use of ether in throat and nose operations may increase the safety of the patient, but in certain manipulations, such as the removal of a foreign body from a bronchus, the use of ether complicates the process and prolongs the operation, and chloroform produces the best results.

Another point must be noted in this connection, viz., the position of the patient. Operations upon the nose and throat are greatly facilitated by the use of the upright position. For this position, however, two factors are essential: first, the anesthetic must be begun and carried on with the patient seated in the position desired for operation; secondly, the anesthesia must be light.

Finally, Wishart has no fear of using local combined with general anesthesia, even when adrenalin is required, provided he can trust his anesthetist. He prefers, for this reason, to work always with the same man, whenever possible, and would advise his confrères to adopt this rule. It requires the most highly trained anesthetist to administer anesthetics in nose and throat cases. These are the cases, in nearly every instance, in which a combination of local and general anesthesia is required.

ACTIVE IMMUNIZATION WITH DIPHTHERIA TOXIN-ANTITOXIN.

The *Journal of the American Medical Association* of December 25, 1915, contains these conclusions reached by PARK and ZINGHER:

1. Individuals who, before treatment, give a negative Schick reaction are immune probably for life, and therefore it is not necessary to inject them, when exposed, either with antitoxin or toxin-antitoxin.

2. Those who give a positive Schick reaction and are exposed to diphtheria and in immediate danger should receive either antitoxin alone or, if a longer protection is desired, both antitoxin and toxin-antitoxin.

3. For the general prophylaxis against diphtheria in schools and communities, excluding immediate contacts, a mixture of toxin-antitoxin alone (from 85 to 90 per cent of the L + dose of toxin to each unit of antitoxin) or toxin-antitoxin plus vaccine of killed diphtheria bacilli is recommended. The dose is 1 Cc. of toxin-antitoxin and 1,000,000,000 bacteria injected subcutaneously and repeated three times at intervals of six or seven days. Sufficient time has not as yet elapsed to judge the value of adding the injections of the bacilli to the toxin-antitoxin.

4. The early and the late results of active immunization should be determined with the Schick test. Early results are those obtained by the application of the test within four weeks, and late results from four months to two years after the immunizing injections.

CARBOHYDRATE INDIGESTION.

TILESTON in the *Journal of the American Medical Association* of December 25, 1915, points out that the treatment of carbohydrate indigestion is mainly dietetic. It consists in a marked reduction of the total carbohydrate intake, with exclusion of certain articles which are known to undergo fermentation readily. Such are potato, sweet potato, cabbage, beans (except string-beans), and chestnuts. The harmfulness of potato in this connection is possibly explained by the work of Lang, who found, in the course of experiments with pancreatic diastase, that potato, though easily changed to achroödextrin, is very slow to undergo the further change into sugar. In obstinate cases, particularly in the fermentative diarrhea of Schmidt, it may be necessary to resort for a while to a strict protein-fat diet, consisting of eggs, meat, fish, bouillon, butter, and tea or coffee with milk or cream. According to Schmidt, a small amount of cane-sugar and fruit jellies may be taken in

addition to the above. After a few days of such a diet, carbohydrates may be added cautiously, one at a time; sugar, cream of wheat, toast or zwieback, macaroni, and rice, in the order named. Potato is best left out of the diet for a long time. In cases without diarrhea, vegetables of low carbohydrate content, such as carrots, turnips, squash, egg-plant, and string-beans, are well tolerated from the first. They should be sieved and served with butter.

If obesity is present, a reduction in the total caloric value of the food should be combined with the limitation of carbohydrates. The relief of indigestion is often a welcome by-product of an obesity cure.

The results of the dietetic treatment of carbohydrate indigestion are most gratifying, dyspepsia of long standing disappearing in a few days. In fact, if relief is not obtained, it is probable that the diagnosis is wrong and some other condition is present.

The drug treatment of fermentation will accomplish little by itself. When combined with regulation of the diet it sometimes seems to be of benefit, but as a rule it is superfluous. The drugs most likely to give relief are the various salicylate preparations and betanaphthol. Belching can be facilitated by the administration of the ethereal oils, such as peppermint, or menthol in half-grain doses. Diastatic preparations are occasionally of service.

THE THERAPEUTIC VALUE OF QUININE AND ITS CONGENERS.

The *British Medical Journal* of December 4, 1915, states that a most interesting and valuable clinical investigation of the relative therapeutic worths of five of the chief cinchona alkaloids, and of two laboratory derivatives of the group, has recently been published by Major A. C. MacGilchrist. The alkaloids tested were quinine, which is levorotatory, and its optical isomer quinidine or conquinine, which is dextrorotatory; cinchonine and its optical isomer cinchonidine, both from the chemical point of view representing quinine without its methoxy group; quinoidine, or amorphous quinine, a tarry, treacly substance obtained from the mother-liquor of cinchona bark after the extraction of quinine and the other crystallizable alkaloids; hydroquinine, which is from the chemical point of view a reduced or hydrogenated quinine, and may be obtained either from cinchona bark or the laboratory; and ethylhydrocupreine or optoquin, a derivative of quinine introduced by Morgenroth and Levy four years ago, which has attracted a deal of attention on the Continent, and has recently been described in the *British Medical Journal.*

In his previous work with these seven alkaloids Major MacGilchrist had shown that optoquin is the least toxic for guinea-pigs, quinoidine the most toxic, while quinine salts came about half-way between the two. On the other hand, as regards infusoria, optoquin was the most lethal, quinidine the least, while quinine and quinoidine came low down on the list. In his trials of these alkaloids upon man the author treated the malarial inmates of two large jails at Alipore. As a preliminary each patient received 4 grains of calomel. The different alkaloids were given in solution and by the mouth, and a dose was administered every eight hours while the treatment lasted, so as to keep the amount of absorbed alkaloid as constant as possible. The dosage was always made proportionate to the weight of the patient. Every eight hours a blood film was prepared in the usual way, using Leishman's or Giemsa's stain, so that the time of the disappearance of the malarial parasites from the peripheral blood could be approximately estimated; a fall of febrile temperature cannot be trusted as a guide to this disappearance. A measure of the activity of each alkaloid was furnished by the period elapsing between the exhibition of the first dose and the disappearance of the asexual parasites from the peripheral blood. In all, 149 malarial patients were kept under observation for the purposes of these investigations.

In his first series Major MacGilchrist treated 72 patients with benign tertian, malignant tertian, or quartan malaria with one or other of four of the cinchona alka-

loids—namely, quinine, quinidine, cinchonine, and cinchonidine. The other three alkaloids were excluded because the larger doses required might have been dangerous. The dosage was at the rate of one gramme to seventy kilogrammes of body weight, given every eight hours. These massive doses invariably caused the parasites to disappear from the peripheral blood after nine doses; in some instances one dose sufficed, in others all nine were requisite. To give an example of the results registered: in the case of benign tertian fever the average numbers of doses necessary were 4.7 for quinine, 5.0 for quinidine, 5.5 for cinchonine, and 5.6 for cinchonidine. This amplitude of variation is naturally too small for a comparative test of the value of these alkaloids, and in addition it must be remembered that the results obtained appear to depend more upon the stage reached by the developmental cycle of the parasite at the moment when treatment is begun than upon any other condition.

In a second series of experiments the attempt was made to determine the minimal effective dose of quinine in the three varieties of malarial fever treated. The number of patients was fourteen; the number of doses was not limited to nine, and the treatment was continued while the patient remained in the jail hospital. As in the previous series, the dosage was proportional to the weight of the patient's body. The second series cannot be regarded as complete or final in any way, but it enabled Major MacGilchrist to conclude, as a working result, that the minimum therapeutic dose of quinine at eight-hour intervals for a patient weighing seventy kilogrammes is 0.1 gramme for benign tertian, 0.15 gramme for malignant tertian, and 0.2 gramme for quartan infections. These doses caused the parasites to disappear from the blood in a few days.

Armed with this knowledge, Major MacGilchrist proceeded to his third series of patients, sixty-one in number. The seven alkaloids were administered to them in the minimal doses given above for quinine, according to the variety of malarial infection present; the medicine was continued as long as the patients remained in hospital. In this series, as in the last, the number of patients with each variety of malaria treated with each of the seven alkaloids is not large enough to justify any final and decisive conclusions. Yet many interesting facts emerge from their consideration. The large doses of the first series acted, as was to be expected, more quickly than the smaller doses of the third series, so that the number of doses given in the latter was larger (but not very much larger) than in the former. On the other hand, the total amount of alkaloid required to free the peripheral blood of asexual parasites in the small dose series was only a quarter to a sixth part of that requisite in the large dose series. Major MacGilchrist's paper contains a great deal of information interesting to parasitologists which must here be passed over; but he gives an interesting comparison of the relative therapeutic antimalarial values of the alkaloids he tested in a tabular statement of the average total amount of each drug, expressed in grammes per 70 kilogramme body weight, required to free the peripheral blood of asexual parasites in benign and malignant tertian infections combined: Hydroquinine hydrochloride 0.765 gramme, cinchonine sulphate 0.915 gramme, quinine sulphate 0.95 gramme, quinidine sulphate 1.12 grammes, optoquin hydrochloride 1.22 grammes, quinoidine 1.79 grammes. These figures are calculated for the free alkaloids, not for their salts.

It is interesting to note that clinical experience with malaria thus agrees with the results of experiment *in vitro* with infusoria, so far as the natural cinchona alkaloids are concerned, but not in the case of optoquin. As for the occurrence of by-effects, summed up in the term "cinchonism," these were practically absent in the small dose series. In the large dose series, quinine, cinchonine, and quinidine were the chief offenders. Apart from their obvious practical applications, it is clear that Major MacGilchrist's valuable results are bound to modify considerably the opinions expressed in the current manuals of thera-

peutics and pharmacology on the various cinchona alkaloids and their relative values in the treatment of malaria. Not a few of his conclusions support opinions previously expressed by Continental workers in this field.

MR. BARKER'S METHOD OF SPINAL ANESTHESIA.

HAIR in the *Canadian Practitioner and Review* for January, 1916, asserts that to Mr. Barker, University College Hospital, London, England, must be given the credit for the present perfection of spinal anesthesia as practiced in many of the surgical clinics in Europe, especially in Britain. Of late many of the earlier difficulties owing to a better technique have been overcome, such as:

1. The prevention of deterioration of the anesthetic by using ampoules made of Jena glass.

2. The breaking of the needle in the spinal canal.

3. Localization of the solution after injection.

The anesthetic now used consists of a solution composed of the following:

Stovaine, 5 gms.
Glucose, 5 gms.
Aqua dest., 100 gms.

Each ampoule contains about 2 Cc., of which only 1 Cc. is injected; the remainder allows for waste or loss.

This solution has a specific gravity of about 1.023, which allows it to gravitate to the most dependent part of the spinal canal.

The needle now used is an ordinary puncture needle made of nickel with stylet that will bend if pressed on, if the patient suddenly kinks the spinal column from pain or otherwise. The use of the nickel needle has done away with the danger of draining away the spinal fluid into the tissues if the needle is broken, and this method is particularly applicable to all methods of spinal puncture.

The patient is usually placed on the side in a horizontal position, on a table with a pillow with an elevated head-rest. The shoulder resting on the table is used to raise or lower the upper part of the spinal canal by drawing the arm forward. The assistant, standing face to the patient's abdomen, forcibly flexes the knees to the face by passing one arm over the back of the neck and the other over the knees and approximating these parts, thus separating the spinous processes. The operator, who is seated facing the back of the patient (his eyes being about on a level with the spinous processes), places his index and middle fingers in the interspace between the second and third lumbar spines, the fourth being taken as in line with the crest of the ilium, and with his right hand passes the needle directly through the skin, then upward and inward until the spinal canal is approached, when the stylet is withdrawn, the entrance to the canal being indicated by the escape of spinal fluid. A few drops are allowed to drain away, and then 1 Cc. of the solution is injected through the puncture needle. The position of the patient is then altered according to the side of the operation. If on one side, he remains there until feeling is lost in that leg, then turns on the back. By elevating the thorax, the solution will gravitate to the lower part of the canal, thus anesthetizing the extremities. The duration of the anesthetic is about forty-five to fifty minutes, and if successfully accomplished is ideal in its action.

The after-effects of the anesthetic are:

1. Headache. This is very variable and usually depends considerably on the temperament of the patient.

2. Vomiting occurs occasionally during the anesthetic stage and disappears as the effects go off.

3. Rarely diplopia. This after-effect seems to be hard to explain.

Spinal anesthesia undoubtedly has a place where patients are not suitable for general anesthetics, being particularly good in old patients in whom shock is of great prognostic value, and in whom kidney function is decidedly lessened. It is not necessary to mention a list of operations, but one in which it can be used with great success is in a prostatectomy, where usually both age and lessened kidney function are factors,

or where marked relaxation of sphincter muscles is desired; besides, nearly all short operations in the lower abdomen or upon the extremities can be performed with decidedly little anesthetic effect.

TETANY IN AN ADULT FOLLOWING POISONING FROM ERGOT.

In the *New York Medical Journal* of December 18, 1915, EMSHEIMER reports a case of this nature. The most common cause of tetany in adults, in this country, is some form of gastric or intestinal disorder, especially dilatation of the stomach. Tetany occurs less frequently in the course of one of the acute infectious diseases, such as typhoid fever or influenza; during pregnancy; after parathyroidectomy; following poisoning from chloroform and various metals; and as a complication of certain organic nervous diseases, such as syringomyelia and cerebellar neoplasm. Its occurrence, however, after excessive doses of ergot is so rare that the following case seems worthy of note:

Saleswoman, aged twenty-five years, single. Past history negative. There had been no previous similar complaint, no symptoms suggesting organic nervous disorder, and no hysterical manifestations. For two days prior to the onset of the present acute illness there had been some diarrhea.

While at work the patient was suddenly seized with severe epigastric cramps, followed immediately by nausea and vomiting. She managed to get to her home. Emsheimer saw her about an hour later. At that time she seemed dazed, semidelirious, and extremely restless. Pressure upon the supraorbital nerve failed to awaken her from her semiconscious state. Attempts to question her brought incoherent replies. Most striking, on further inspection of the patient, was the position of her extremities. There was a more or less general rigidity of both arms and legs and a typical bilateral carpotarsal spasm. The elbows and wrists were acutely flexed, and the hands drawn toward the ulnar side; the thumbs were adducted beneath the fingers; there was flexion of the metacarpophalangeal joints, extension of the phalangeal articulations. The feet were extended at the ankles, the toes flexed at the metacarpophalangeal joints. The Chvostek sign was easily obtainable. The Trousseau sign could not be elicited. There were no facilities for testing the electrical reactions. The reflexes were difficult to interpret on account of the rigidity of the muscles of the extremities. There were no other abnormal physical signs.

Within ten minutes of the administration of fifteen grains of chloral hydrate and thirty grains of the triple bromides, per rectum, full consciousness returned, and the spasm of the hands and feet began slowly to relax. It was fully one-half hour, however, before all the evidences of carpotarsal spasm had disappeared. A second examination of the patient at this time revealed normal mentality, normal reflexes, and normal sensations. There were no tremors, local contractures, nor areas of anesthesia.

On questioning the patient as to the cause of her illness, Emsheimer elicited the fact that, one week before the onset of the present attack, the patient, having passed her menstrual period three days, took a large dose of fluid extract of ergot (quantity unknown, as she had taken a swallow of the liquid directly from the bottle), and continued its use in teaspoonful doses every two hours for five days. She had had some nausea and diarrhea, but no other symptoms of ergotism, up to the onset of the present condition. There was still amenorrhea.

Despite the fact that the symptoms of tetany became manifest only after a period of two days from the date at which the ergot was discontinued, there seemed to be no other etiological factor which could satisfactorily explain the peculiar phenomenon. Autointoxication or acute gastric dilatation as a cause of the spasm was practically eliminated by the fact that the patient had not eaten an excessive amount of food in the few days prior to the onset of the attack; had not partaken of fish, canned meat, or any other food capable of producing ptomaine poisoning. Moreover,

no physical signs presented of dilatation of the stomach. The tetany of pregnancy was ruled out by the fact that tetany occurs in this condition only during the later months. The diagnosis of hysterical pseudotetany, with the fear of possible pregnancy as a most important contributing factor, was not so easily precluded. But the lack of previous hysterical manifestations and the absence of physical signs of true hysteria rendered that diagnosis less likely than that of acute toxic tetany, from the delayed or cumulative action of ergot.

Unfortunately, Emsheimer was not able to make further observations in this case as he did not see the patient a second time. He was informed, however, about one month later, that she had had a recurrence of her acute attack.

CLINICAL OBSERVATIONS ON LUETIC DISEASE OF THE HEART AND AORTA.

MUSSEY in the *Journal-Lancet* of December 15, 1915, after discussing this subject at some length concludes as follows:

1. In 1379 cases of syphilis, clear-cut syphilitic disease of the heart or aorta occurred in 59 (4.29 per cent).

2. The aorta seems to be affected by syphilis more frequently than the heart.

3. Syphilis of the heart does not present a typical syndrome other than that of myocardial change. The positive Wassermann is almost necessary for a definite diagnosis.

4. Syphilis of the heart, while presenting graver immediate symptoms, responds more readily to treatment, and the benefit is more lasting than in syphilis of the aorta.

5. Syphilis of the mediastinum presents a clinical history similar to that of cardiac syphilis, and also shows a similar benefit from treatment.

6. The use of potassium iodide with mercury is of value, even when the patient is showing marked evidence of decompensation.

7. The use of the iodides and mercury in some cases seems of value preceding the use of salvarsan.

8. Salvarsan, and especially neosalvarsan, is of considerable value in syphilis of the heart and aorta, and can be used in small doses even in severe cases.

9. The use of vigorous and persistent antispecific treatment will relieve the discomfort, and apparently arrest the progress of certain aneurismal cases.

THE TREATMENT OF THE DISTURBANCES OF DIGESTION IN INFANCY.

In the *New York State Journal of Medicine* for February, 1916, MORSE tells us that so little is known accurately as to the normal intestinal flora and as to the normal variations in the relation of the individual elements of this flora to each other as the result of changes in the relative proportions of the various food elements, that it is extremely difficult to draw any positive conclusions from the microscopic examination of the stools, not only as to what organism or organisms are causing the trouble in a given case, but also as to what organisms may in general cause excessive fermentative changes. There is a certain amount of fairly satisfactory evidence to show that butyric acid bacilli, the B. acidophilus and the B. putrificus, may cause abnormal fermentative changes in the intestinal contents. It is probable that under certain conditions the colon bacillus may also be the cause of abnormal fermentative processes. The unrestrained and excessive activity of the normal lactic-acid-forming organisms of the intestinal flora may also result in an excessive acid fermentation sufficient to cause definite and severe symptoms.

It is often difficult to distinguish between simple indigestion and indigestion with fermentation. Indigestion with fermentation is in general, however, a more serious condition than simple indigestion. It is more often acute than chronic. It is likely to be associated with fever, which is often high. Vomiting is relatively uncommon. Diarrhea is a marked symptom in almost all cases. The character of the stools depends upon which of the food elements is being

attacked by the microörganisms which are the cause of the trouble in the individual case. In the vast majority of instances indigestion with fermentation is due to organisms which produce fermentative changes in carbohydrates and to a less extent in fats. The stools are, therefore, usually green in color, strongly acid in reaction and odor, and irritating to the skin. They often contain a considerable amount of mucus, as the result of the irritation of the intestinal mucosa by the highly acid intestinal contents. They are often frothy, and not infrequently contain many small, soft, fat curds. When the disease is caused by the abnormal activity of proteolytic organisms, the stools are more often yellow or yellowish-brown than green. They are ordinarily alkaline in reaction and have a foul odor. They seldom contain curds, and mucus is a less prominent constituent. In one type of this class of cases the stools are rather characteristic, being frequent, small, watery, dark-brown, alkaline, and with a peculiar musty odor.

It is advisable in all acute cases of indigestion with fermentation to at once thoroughly clean out the intestinal tract. All food should be stopped for from twelve to twenty-four hours and water given freely. It is not safe, however, to continue the period of starvation longer than twenty-four hours when the microörganisms which are causing the trouble are of the proteolytic type, because the intestinal secretions are protein in nature and therefore provide a suitable culture medium for proteolytic bacteria. There is no objection to a longer period of starvation when the microörganisms are of the types which thrive on fats and carbohydrates.

The object to be aimed at in the treatment of indigestion with fermentation is the destruction, or at least the inhibition, of the activity of the microörganisms which are the cause of the disease. It is useless to attempt to do this by the administration of drugs by the mouth, because it is impossible to give any of the so-called intestinal antiseptics in large enough doses to have any effect on the pathogenic bacteria in the intestine without poisoning the baby. If they did have any action it would be exerted, moreover, on the antagonistic as well as the pathogenic bacteria. They would be likely, therefore, to do as much harm as good. It is possible that the salts of bismuth may diminish the intensity of the symptoms to a small extent. They do not have, however, any curative action. If used, they should be given in large doses. The subcarbonate or the milk of bismuth are safer than the subnitrate. Irrigation of the bowels is useless, because the fluid does not reach the small intestine, where the trouble lies.

It is possible in some instances to destroy the pathogenic microörganisms, or at any rate to materially diminish their numbers and inhibit their activity, by the administration of antagonistic bacteria. This method has been proved to be effectual when the disturbance is due to the B. perfringens and organisms of the gas bacillus group. Lactic acid bacilli have an antagonistic action on all of these organisms. They are indicated, therefore, in the treatment of indigestion with fermentation due to organisms which thrive on carbohydrates. They may be given in the form of broth cultures, in the form of buttermilk, or in the form of modified milk ripened by them. The best method of giving them, however, is in the form of ripened modified milk, because when given in this way the food can also be modified to suit the needs of the individual infant. Lactic acid organisms are also indicated in those conditions in which the disturbance is due to the proteolytic organisms which they antagonize. They should not be given, of course, in those cases in which the disease is due to the excessive activity of lactic acid organisms.

Another way by which the number of the organisms causing indigestion with fermentation can be diminished and their activity inhibited is by a change in the character of the infant's food. A change in the character of the food results in a change in the character of the intestinal contents—that is, in the medium in which the patho-

genic organisms are growing. If these are of the types which thrive on carbohydrate media, the percentages of the carbohydrates should be diminished and that of the protein increased. The percentage of the fats should also be diminished. When the organisms are proteolytic, the percentage of the protein should be diminished and that of the carbohydrates increased. When the disturbance is due to fermentation of the carbohydrates, much can be accomplished by changing the character of the carbohydrate. Protein food, such as beef juice, broth, and albumen water, should not be given in the cases in which the disturbance is due to proteolytic organisms. It is not usually necessary to examine the stools bacteriologically, because it can almost always be told from the character of the stools whether the organisms at fault are those which thrive on carbohydrates or those which thrive on protein.

Babies that are seriously ill with indigestion with fermentation are very likely to show one or more rather characteristic symptoms or groups of symptoms. One of these groups of symptoms almost invariably develops toward the end in fatal cases. These symptoms are:

(*a*) Excessive vomiting.

(*b*) Hyperpyrexia.

(*c*) Symptoms of irritation of the central nervous system.

(*d*) Prostration and collapse.

It is probable that these symptoms are chiefly manifestations of toxemia. It is presumable that the loss of water through the bowels may also play a part in their production.

If, when any of these symptoms appear, there is any doubt as to whether the bowels have been thoroughly emptied, it is advisable to repeat the initial catharsis. It is also advisable, if the condition of the nutrition warrants it, to withhold food for about twelve hours. Caution must be exercised, however, about withdrawing the food if the disturbance is due to proteolytic organisms. If there is excessive vomiting, food should be withdrawn entirely and the stomach washed out with a solution of bicarbonate of soda. The hyperpyrexia is best treated by the use of cold externally. It is seldom advisable to give the coal-tar products to infants to reduce the temperature. Bromide of soda, in doses of from five to ten grains, by the mouth, may be given for restlessness and excitement. It may be combined wtih one or two grains of chloral hydrate. It is useless to give drugs by enema in this condition as they are almost never retained. Small doses of morphine subcutaneously may be necessary. If the fontanel is full, a lumbar puncture will often give relief. Prostration and collapse are to be treated as when they occur in other conditions. It must be remembered, however, that all forms of treatment weaken and exhaust the baby. The baby should be disturbed as little as possible. Alcohol is contraindicated when these conditions are associated with vasomotor paralysis and lowering of the blood-pressure. Adrenalin is of some value, but must be given subcutaneously or intravenously. Strychnine is in general the most useful of the stimulants, while caffeine and camphor are the best quick stimulants.

THE TREATMENT OF CHOLERA BY THE ADDITION OF ATROPINE TO THE HYPERTONIC AND PERMANGANATE TREATMENT.

In the *Indian Medical Gazette* for January, 1916, ROGERS says that atropine hypodermically has further greatly reduced the death-rate in cholera. It appears to act by lessening shock, raising the blood-pressure, diminishing the frequency of the respiration, increasing the flow of urine, and diminishing slightly the number of intravenous injections required. The number of deaths from collapse and from pneumonia has been greatly diminished, while the total mortality in the atropine series has fallen off one-half that of the controls, and to but little more than one-sixth of the death-rate before he introduced the present system of treatment; a reduction in the mortality of a very serious specific disease by means of simple measures,

based on prolonged scientific research, controlled by minute clinical observations, which, even in these days of rapid advance, has probably only been equaled by the antiseptic treatment of wounds, antidiphtheric serum, and emetine in amebic disease.

In view of the importance of the addition of atropine and alkalies to the hypertonic saline and permanganate treatment of cholera, it may be well to take this opportunity of briefly summarizing the principal points in the present system of treatment of Rogers.

On admission give one-hundredth of a grain of atropine hypodermically and repeat it morning and evening. Take the specific gravity of the blood, the blood-pressure, and the temperature in the mouth and rectum. If the blood-pressure is not over 70 mm., or the specific gravity is 1063 or over, give an intravenous injection of sterile hypertonic saline of three, four, five, or even six pints, in accordance with whether the specific gravity is 1063, 64, 65, or 66 and over in male adults, and correspondingly less in females and children in proportion to their approximate weights. Unless the rectal temperature is below 99° F. the saline should never be injected at above blood heat (98° F.) for fear of producing hyperpyrexia. If the rectal temperature is 100° F. or over, the fluid should be given at a temperature between 80° and 90° F. The hypertonic solution should contain 120 grains (8 grammes) of sodium chloride and 4 grains (0.4 gramme) of calcium chloride. Rogers for long added 6 grains of potassium chloride, but some physiologists consider it unnecessary and possibly harmful, so he now omits it. Permanganate of potash to be given in two-grain pills, made up with kaolin and vaselin, and preferably coated with salol or keratin, two pills every quarter of an hour for two to four hours, in accordance with the severity of the case, and then two every half-hour until the stools change to green or yellow and become comparatively small. Barley water and plain water by the mouth in small quantities at a time (three or four ounces) to be given frequently, but no other food during the attack. Normal saline (sodium chloride, grains 90 to a pint) half a pint every two hours by the rectum until the collapse stage is passed and urine is being excreted regularly, and then reduced in frequency to every four hours and continued until two pints of urine are passed in twenty-four hours.

The fall of the blood-pressure to 70 and under, or the rise of the specific gravity to 1063 or above, are indications for a repetition of the intravenous injection, estimations being made regularly morning and evening, and at any time that the pulse tends to fail or the patient becomes restless. At each repetition of the injection, and at the first injection in all cases admitted late with suppression of urine for twenty-four hours or more, give one pint of the following alkaline solution: Sodium chloride grains 60, and sodium bicarbonate grains 160 (2 per cent), and continue with the ordinary hypertonic solution up to the total amount indicated by the specific gravity of the blood. The alkaline solution counteracts the tendency to acidosis, which is the most essential cause of post-choleraic uremia.

If the urinary excretion is deficient in the later stages with a blood-pressure of 100 mm. or more and a specific gravity of below 1063 but not much below the normal point of from 1056 (in Indians) to 1058 (in Europeans), give one pint of the above solution subcutaneously, or better intravenously, to increase the urinary flow. The alkalies in such cases should also be given by the rectum instead of normal saline.

If the blood-pressure remains persistently much below 100 mm. and urine is deficient, give pituitrin hypodermically and caffeine sodio-salicylate in five-grain doses by the mouth every four hours, and dry-cup and foment over the kidneys repeatedly.

In very young children and feeble old patients glucose may be given in the rectal saline to support the strength.

The above are the main points in the treatment of cholera on the system of

Rogers, worked out from a minute study of over 1000 cases in which detailed notes have been kept, tabulated, and analyzed. Full details regarding the technique of intravenous injections will be found in his book on the subject.

AUTOGENOUS VACCINES IN THE TREATMENT OF BRONCHITIS AND ASTHMA.

BABCOCK in the *Lancet-Clinic* of February 12, 1916, reports his results in the treatment of asthma and bronchitis by autogenous vaccines. He reaches these conclusions:

1. Autogenous vaccines from the sputa have yielded such results in three cases of acute bronchitis, one of chronic bronchitis and four of chronic bronchitis associated with attacks of spasmodic asthma, as to warrant the writer in recommending this mode of therapy as against the old-time use of expectorants.

2. In bronchitis independent of asthma, the organisms have been mainly of bacillus mucosus, the diplococcus mucosus, the micrococcus catarrhalis, and an influenza-like bacillus, while in cases of bronchial asthma an anaerobic fusiform bacillus has been added.

3. The asthma has yielded to this vaccine treatment only when this anaerobic fusiform bacillus has been largely present in the vaccine.

4. Great care should be exercised in the use of vaccines that the dosage be not so large or so often given as to cause reaction, since this reaction, whether general or local, indicates a negative phase and aggravates the patient's condition.

The main drawback to the use of autogenous vaccines is the necessity of perhaps several cultures, and the preparation of new vaccines should the cultures show that some of the originally found germs have disappeared or become subordinate in number to others.

6. New vaccines should be prepared whenever the condition of the patient seems to have come to a standstill.

THE THERAPEUTICS OF CANCER.

The *Medical Record* of April 8, 1916, points out that the renewed interest in cancer which followed the discovery that malignant growths can be transplanted from one animal to another has extended from the domain of experimental pathology to that of therapeutics, and no sooner is a report issued from the laboratory than the procedure is tried at the bedside. It is right that this should be so, provided only inoperable cases are chosen, for in our efforts to control this dreadful scourge nothing must be left undone; the immediate and blind application of a method, however, is not right. The attitude of the therapeutist toward the laboratory should be as critical as he can make it, in order that he may be in a position to select the most reliable results for his clinical investigations; an experiment, said a great investigator once, is not necessarily scientific because it has been performed on a rabbit.

But even more important than this critical attitude should be one of endeavor to discover exactly what it is that the laboratory is trying to bring about. For example, while it has been discovered that mice can be immunized with normal mouse tissues against the inoculation of tumors, it has been expressly stated by those best qualified to know that such treatment has no effect upon transplanted tumors already established. Now as these are under relatively unfavorable conditions compared with spontaneous neoplasms, being composed of the cells of an animal other than that in which they are proliferating, while the latter consists of cells of the animal itself, it is evident that transplantable growths should be much more easily cured than spontaneous; and yet even these inoculable neoplasms cannot be healed at present. Nevertheless, many attempts have been made to cure spontaneous tumors in man, in spite of this distinction, by the injection of normal human tissues, generally in the form of extracts, although the laboratory has definitely explained that living and intact cells are necessary for the production of immunity; and not only have normal

tissues been tried, but emulsions of living tumor cells have been introduced, which, in several instances, have led to the production of new tumors at the point of inoculation.

All this is not so much the fault of the clinician, perhaps, as it is his misfortune, for he is no better able to judge between conflicting laboratory reports than the experimental pathologist would be to choose between two rival therapeutic methods. On the other hand, pathologists do not differ so greatly in opinion as the contradictory nature of much of their writing would suggest; a great deal of the apparent disagreement is due to the fact that it was not realized in the first few years of cancer research that transplantable tumors vary remarkably in such characteristics as type of growth, susceptibility to immunity, etc., and that in some of them even complete spontaneous disappearance is not an unusual occurrence in untreated animals. Fränkel and Fürer (*Wiener klin. Wochenschr.*, 1915, xxviii, 1433, and 1916, xxix, 63) have, therefore, performed a work of great value to both clinician and pathologist in reviewing some of these earlier conflicting findings in the light of our more recent knowledge. They have carefully investigated the question whether cell-free juices from the tumors of rats and mice have any immunizing or therapeutic action in these animals, and have found that they possess neither.

Their second paper is devoted to a discussion of the effect of foreign sera upon growing tumors, it having been assumed by various writers that the serum of a normal individual differs from that of the cancerous organisms in the possession of some substance injurious to the cancer cell, or that it contains a ferment with the power of dissolving tumor cells. Fränkel and Fürer very wisely divorced themselves from all theory, and set themselves the task of finding out simply whether foreign serum would or would not influence the growth of transplantable neoplasms. Mice bearing carcinoma or sarcoma were inoculated intravenously one or more times with horse, goat, sheep, goose, rabbit, and guinea-pig serum, but in no case was the tumor definitely affected, although amounts of from one-fortieth to one-twentieth of the body weight were introduced. In a few of the animals the rate of proliferation was somewhat retarded; but a similar occurrence was noted in some of the untreated controls. The experiments have an important bearing upon the many attempts that have been made to influence new growths in the human subject by the injection of serum from adults or from infants, the procedure being based, in the latter instance, upon the false assumption that because infants do not have cancer there must be some protective substance in their blood.

In conclusion, it is necessary to point out only that no authoritative cure of either transplantable or spontaneous neoplasms in animals has yet been published, even the selenium cure, from which so much was looked for in some quarters, having been proved a complete failure. In man, therefore, the surgeon still may, with more or less apparent justification, claim that the only hope of relief lies in early and complete surgical removal.

NITROUS OXIDE IN OBSTETRICS.

The *Boston Medical and Surgical Journal* of March 30, 1916, contains an article by IRVING in which he reaches these conclusions:

1. Nitrous oxide and oxygen is the most successful analgesic known for the relief of the pains of labor.

2. It is the safest anesthetic there is. It has no untoward effects, immediate or remote, upon either mother or baby.

3. It does not delay labor or in any way impair the efficacy of the uterine contractions.

4. It is pleasant to take, and recovery from it is extremely rapid and usually featureless.

5. It can be administered anywhere, and it can be employed by any physician who will take his confinement cases seriously enough to retain a capable assistant for its administration.

PROMPT CURE OF GONORRHEA.

WYETH (*New York Medical Journal,* Feb. 5, 1916) states that if a patient is seen within twenty-four hours after a urethral discharge has begun, except in primary cases, a cure can be effected in five to seven days. A microscopic examination of the pus is first made. Here at the outset we can determine the prognosis with a certain degree of accuracy by the microscopical findings, for it has been the author's observation that cases with a profuse, purulent discharge, in which the leucocytes show that they are functioning by the pus corpuscles being filled with gonococci, invariably yield more kindly to this treatment than do cases with scant discharge in which gonococci are mostly extracellular. The patient is instructed to urinate into two glasses, passing most of the urine into the first glass and the last two or three teaspoonfuls into the second glass. If this second urine is clear, and the patient gives no clinical evidence of a posterior involvement or other complications, we may hope to succeed with the so-called abortive treatment. By means of a Janet-Frank syringe with a Wheeler tip, the anterior urethra is flushed with 300 to 450 Cc. of a 0.25- to 0.5-per-cent solution of protargol, depending upon the intensity of the inflammation. The head of the penis is held firmly between the thumb and first finger of the left hand, the tip of the syringe is inserted into the meatus, and the solution slowly injected until the anterior urethra is filled. The syringe is then slightly withdrawn, and the solution is allowed to flow out. Successive flushings are continued until the whole amount of solution is used, always with care that no undue pressure is exerted, as from the use of an elevated irrigator.

A hand syringe of at least two drachms' capacity is prescribed, and the patient is instructed how to inject the urethra himself every four hours, being told first to urinate and then slowly and gently inject the solution, which is to be retained in the urethra for three minutes. This procedure is to be repeated, thus making two three-minute injections every four hours. Very often after such treatment, at the patient's visit the following day, the author has found that the microscope showed no gonococci. In such cases a fairly encouraging prognosis may be made. Even if a few gonococci are still to be seen, there is no reason for discouragement as to the possibility of cure within five or six days. The initial treatment is repeated, and the patient reports on the following day, though more favorable results may be expected if the patient can be seen twice daily. No internal medicine is given, and no diet regulation is attempted, beyond the advice that the patient abstain from alcohol and highly seasoned foods. Exercise should be interdicted to prevent complications, and the patient is directed to drink freely of water.

After the third day, if no gonococci are found, the frequency of the patient's injections is decreased; and after the fourth day all treatment is discontinued, although the patient is kept under observation. Should he remain free of gonococci the case is said to be aborted. If, on the other hand, not all the gonococci have been eliminated, immediate treatment is again instituted and regulated by the microscope. Though our hope may not have been realized, yet we have at least the satisfaction of knowing that we have not unduly prolonged the attack, and that by continuing the treatment we can limit the duration of the gonococcal infection to from three to six weeks instead of the usual six weeks to three months.

THE PREVENTION OF PERITONEAL ADHESIONS BY THE USE OF CITRATE SOLUTIONS.

WALKER and FERGUSON (*Annals of Surgery,* February, 1916) contribute a convincing paper with the following conclusion:

Hypertonic citrate solutions do, under certain conditions, prevent peritoneal adhesions after laparotomy. The best solution is sodium citrate 3 per cent and sodium chloride 1 per cent.

In human surgery, the citrate solution should, theoretically, be used as it has been experimentally—*i.e.,* after clean laparoto-

mies, a sufficient amount of solution should be introduced into the abdomen to bathe the whole peritoneum. Smaller amounts would be of little value, for any fluid introduced into the abdomen soon becomes distributed over the whole cavity. Practically, the question of whether or not the citrate solution will cause surgical shock in humans must be determined by actual tests in the operating room. If, as we anticipate, no shock is caused, the solution should be used as advised above.

When it is necessary to pack off intestines with gauze, if the pack is wet with citrate solution much fewer adhesions should result.

Absolute asepsis is essential. Adhesions cannot be prevented in the presence of infection.

Gentleness in handling peritoneum is important, for the more injured peritoneum left after operation, the greater is the likelihood of adhesion formation.

Large areas denuded of peritoneum should be covered by plastic operations or omental grafts, for the larger the denuded areas left, the more difficult is the prevention of adhesions.

Iodine should be used in abdominal surgery with great care, or better, not used at all, for a very little of it allowed to touch the bowel causes masses of adhesions.

Dry gauze should not be allowed inside the abdomen.

Pope (same journal) corroborates these findings, stating that he has experimentally demonstrated that the citrate solutions are definitely superior to all hitherto suggested measures.

THE INDUCTION OF LABOR IN NORMAL PELVES AT TERM.

REED (*Surgery, Gynecology and Obstetrics,* March, 1916) assumes that a mature child is 50 cm. long and weighs between 5 and 8 pounds. The estimate of the child's size as obtained by Ahlfeld's rule rarely varies more than 2 cm. from the actual postpartum findings, and usually is as close as 1 cm. or less. Ahlfeld's rule is simple. In vertex cases measurements are made with the pelvimeter from the upper border of the symphysis to the breech of the child; the result is doubled and 2 cm. subtracted for the thickness of the abdominal walls. The result is the length of the child. Seventeen weeks from conception is accepted as the approximate date of quickening. Thereafter 22 weeks are counted from this day as the culmination of the pregnancy.

The next step is to have the labor come on at the time set. The work may be done in any aseptic environment, but the hospital is preferable. The patient receives attention to the bowels the night before, and in the morning is given careful obstetric preparation of external genitalia. Then under strictest asepsis a Voorhees bag is introduced without rupture of membranes. Brodhead's report of 139 cases in 1912 is pioneer work in this field and has not received the attention it deserves.

The technique is as follows: Assemble and sterilize by boiling 20 minutes a Voorhees bag No. 4, a Simon speculum or vaginal retractor, a pair of long Pean forceps, 2 pairs vulsellum forceps, 1 dressing forceps, 2 pairs compression forceps, a Goodell dilator, 1 tenaculum forceps, a hand bulb syringe with glass tubes and rubber connections for the bag.

The patient, prepared as for delivery, is placed upon the table in exaggerated lithotomy position. Stirrups will serve. The vagina is retracted, a smear made from the cervix, and the mucous membrane wiped clean with pledgets of gauze on forceps. Anesthesia is only occasionally necessary even in primiparæ. Before using, the apparatus must be tested by forcibly filling the bag with sterile solution. One lip of the cervix is seized by the vulsellum forceps and brought down. Usually, even in primiparæ, the os is sufficiently patulous to admit the bag; if not, dilate.

The bag is emptied of residual air and fluid and the flat end pulled out. It is now rolled up into a compact mass like a cigarette and seized with Pean forceps, so that the tips extend just to the largest diameter

of the rolled bag. Anoint with sterile glycerin, turn the curve of the forceps toward the patient's left leg, and introduce. As the bag enters, turn the mass to the operator's left—a quarter turn—so that when the operation is completed the forceps curve looks upward. Release lock on forceps. Connect tube with syringe and force sterile solution slowly into the bag. Pean forceps may be removed as bag fills. Remove vulsellum. Tie tube with tape when bag is full, disconnect syringe. Put sterile pads on each side of tube.

If pains do not start within an hour, or if compression is desired as in placenta previa, or a more rapid dilatation, then a weight of one or two pounds is attached by a tape to the protruding tube and passed over the foot of the bed. Uusually in from five minutes to half an hour contractions begin, and labor has been inaugurated just as one would start the pendulum of a clock.

In a variable period, rarely more than four hours—three hours and twenty minutes was the average in the author's series—the bag is expelled by strong pains, the dilatation is practically complete, the head follows the bag down, the membranes rupture, and the second stage begins. From now on the case is managed according to general obstetrical principles. If the pains are weak and shallow, pituitrin may be administered; if strong and regular, morphine and scopolamine or gas or chloroform may be added. The tedious, exhausting, and painful first stage has been materially shortened and definitely controlled. The bag acts as a dynamic stimulant to the contractions, as well as a mechanical aid to cervical dilatation, and it preserves the membranes from injurious pressure until physiological rupture occurs.

In a series of 100 consecutive cases, the bag broke shortly after the insertion six times. There were two maternal deaths, one from placenta previa and one from pneumonia. Seven babies died. There were three cases of version and extraction for placenta previa, transverse presentation, and prolapsed cord. There were four cases of breech presentations, two of placenta previa, one of prolapsed arm, one of mitral stenosis, one of mitral insufficiency. There were 17 cases of lacerations of the perineum, of two degrees or less, and episiotomy. Forceps were used in 23 cases, seven cases had postpartum temperature.

The highest advantage of the procedure lies in the fact that the course of labor is entirely under the control of the obstetrician from start to finish. There is no timidity, indolence, or dubiety. The day is appointed; the cervix dilated slowly or quickly, the contractions are strengthened or weakened; the pelvis is enlarged or let alone; complications are boldly met or foreseen and avoided; the labor is hastened or prolonged; the pain is permitted, diminished, or abolished according to the judgment of the operator. The process works in strict harmony with the principles of modern science.

THE PRODUCTION AND SELF-DESTRUCTION OF DOMESTIC FLIES IN HORSE MANURE.

ROUBAUD (*Journal of the Royal Army Medical Corps,* January, 1916) presents an article of great importance upon this question. He notes that manure kept only for twenty-four hours in a stable produces in the warm months an average of 10,000 to 20,000 flies per cubic meter; the proportion may even reach 30,000 to 35,000. It is estimated that a horse produces sufficient manure to give rise to the development during the summer of 40,000 to 50,000 flies per month, even 160,000 to 200,000 flies during the most favorable season, viz., June and September.

Fresh manure alone plays a part in the production of flies. The laying of eggs even takes place in the stable on the dung impregnated with urine, an indispensable condition. Oviposition may continue for twenty-four hours, but never later. Fermentation, after barely twenty-four hours, definitely protects the manure from the laying of eggs. Antiseptic substances and larvicides (borax, cresol, ferrous and ferric salts), by delaying fermentation, may prolong deposition one or two days. Em-

ployed as larvicides these substances, by prolonging the period of infestation, often produce a result the very opposite of that intended. From the sixth day manure when placed in a heap does not contain larvæ, these having migrated to the base for nymphosis. Antifly measures, therefore, ought to be taken within five days of the removal of the manure from the stable. Manure twenty-four hours old at the time of the removal does not contain visible larvæ. The eggs which are disseminated throughout the manure heap then open and the larvæ come to the surface, leaving the central parts as fermentation develops and the temperature rises. On the following day a temperature of 70° C. to 90° C. may be found in the center of the heap.

The heat arising from fermentation in a manure heap may be used as a means of destroying the larvæ which it contains. The larva of the domestic fly, protected from the gases of fermentation, dies in three minutes when exposed to a temperature of 50° C. In contact with the gases it dies in one minute at 51° C., in five to seven seconds at 59° C., and four to five seconds at 60° C. When a manure heap is turned over the larvæ which come in contact with the hot parts in the interior are killed at once. A complete stirring up of the manure on the day after the deposition, and repeated on the two following days, causes a disappearance of ninety per cent of the larvæ. This operation is more easily and quickly done if, instead of waiting until the infected heap has itself produced the necessary temperature, it is exposed to the heat of a heap previously fermented. For this purpose, instead of placing the new manure on the surface of the heap, as is usually done, it should be buried in the hot parts by covering all its surfaces with a layer of hot manure twenty centimeters thick. In four or five hours the new manure may be considered as entirely free from eggs and larvæ, which would otherwise have developed in thousands.

This biological method of delarvization by heat is equivalent to the heating of the whole of the fresh manure to a temperature of 50° C. to 60° C., and is effected without apparatus and without fuel. It is within the reach of all, and only a simple training of the personnel is required. In practice, it is found that the mass of fermented manure required to furnish the necessary temperature is about eight times that of the fresh manure to be treated. Next day this may be used in its turn as a source of heat. The biothermic method of treating fresh manure can alone destroy quickly and cheaply the eggs and larvæ in a manure heap. The various methods of covering in manure heaps with materials such as earth, straw, etc., can only prevent the flies on the outside from depositing their eggs on the surface of the manure; they cannot hinder the development of the eggs which have been previously deposited on it in the stable. Now these furnish the greatest proportion of the larvæ, and from them, according to Roubaud's experiments, at least eight thousand to ten thousand flies originate.

CYSTINURIA AND CYSTIN STONES.

KRETSCHMER (*Urologic and Cutaneous Review,* January, 1916) refers to Wollaston's first case of cystin stone observed in a child aged five, and states that since the publication of the first paper in 1810 he has found reports of 107 cases of cystin stone, including the two cases he personally observed. These two cases were twin boys aged nine. The calculi were removed by litholapaxy. Other members of the family showed the presence of cystinuria. It has been long recognized that cystinuria does occur in families. In this particular family consisting of six members two had cystin stone, one showed the presence of a sulphur reaction, and the sixth was normal. When found the stones are practically always pure cystin.

Möorner has shown that cystin could be obtained by the hydrolysis of hair, and later Embden obtained it by the hydrolysis of serum and egg-albumen. The *x*-ray gives positive shadows. Treatment for cystinuria is unsatisfactory. The calculi should be removed.

THE RATIONALE OF CHEMOTHERAPY IN SYPHILIS.

McDONAGH (*Lancet*, Jan. 29, 1916), who claims to have shown that the spirochæta pallida is not the sole cause of syphilis, but only the adult male phase of a protozoön, believes he has demonstrated that the Wassermann reaction is a physical one dependent upon certain physical properties that syphilitic sera naturally possess, but which ordinary sera could easily be made to possess. It is not in any way a specific reaction.

Ehrlich held that a union takes place between salvarsan and the parasite with destructive action upon the latter. What the nature of the union is and why the death of the parasite should follow are not explained.

As a result of Ehrlich's statements, every one believes that the only active principle in salvarsan is the arsenic. McDonagh believes that the only action of the arsenic is catalytic—that is, that it accelerates an action going on spontaneously, but more slowly without its assistance. Mercury probably acts in the same way. The question naturally is asked as to why arsenic in salvarsan is more powerful than mercury, since the latter in ordinary circumstances is a more powerful antisyphilitic remedy.

A ratio exists between the intensity of action of a catalyzer and the degree of the colloid state in which the catalyzer is. In salvarsan the arsenic is in a colloidal state, hence its action would necessarily be greater than that of any mercurial compound which we are in the habit of using. The proof of what has been said can be found if we compare the action that different manganese compounds have on plant oxidases. Manganese formate, for instance, has nothing like such a powerful accelerating action upon plant oxidases as colloidal manganese hydroxide. The latter is colloidal and the former is not.

It will now be seen that the action of arsenic is somewhat analogous to that of complement in the Wassermann reaction, while the double benzene ring with its amino groups is analogous to the reagin or the antigen. The reaction between reagin and antigen is one of absorption, a reaction accelerated by the catalyst complement. The reaction between the syphilitic parasites, the lipoid-globulin molecules of the serum, and the amino groups of salvarsan is also one of absorption, a reaction accelerated by the complement present, allowing the arsenic to fulfil its action in increasing the amount of active oxygen. Not only does absorption take place between salvarsan and the phases of the leucocytozoön syphilidis, but also between the drug and the colloidal lipoid-globulin molecules of both the serum and the plasma cells. Therefore Ehrlich's statement that the drug is parasito-tropic only, and not organic-tropic, cannot hold good. For a drug to be parasito-tropic it must be organo-tropic. Indeed, its organo-tropic properties are more important, since most of the organisms are killed indirectly.

The fact that salvarsan can become attached to parasites, and yet not be fatal to them, is an observation in which there is a great deal wrapped up. The complement-fixation test, as applied to syphilis, in contradistinction to the true bacterial complement-fixation tests, depends not upon the molecules having homologous stereo-chemical molecular configurations, but solely upon their number and size.

The attachment of salvarsan to the syphilitic parasites, to the plasma cells, and to the lipoid-globulin molecules in the serum in a case of syphilis cannot possibly be due to a homologous stereo-chemical molecular configuration between the absorbed molecules, since, for one thing, salvarsan alone is an optically inactive body. The absorptive capacity as a whole appears to be greater in the case of a syphilitic serum than in the case of a serum from any bacterial disease, and it appears to be greater according to the stage of the disease.

As the lipoid-globulin molecules from a late case of syphilis are richer in carboxyl groups than those from an early case of syphilis, it follows that any substance they happen to absorb will tend to break down the molecules. The first action of breaking

down the lipoid-globulin molecules is to increase the area over which they can work; hence the reason why late syphilitic lesions disappear more quickly under treatment than do early ones.

Salvarsan becomes attached to the lipoid-globulin molecules of the syphilitic parasite, the plasma cells, and the serum by virtue of its ortho-amino groups and of the peculiar physical properties of protozoal lipoid-globulin. It attacks those phases of the leucocytozoön syphilidis in which reaction is most marked, especially the spirochætal phase, in virtue of its free hydroxyl groups directly, while its main action on the other phases is indirect. The arsenic presumably becomes converted into a hydroxide, in which form it acts as a peroxidase. The action of a peroxidase is to convert a peroxide into active oxygen. If active oxygen is formed in this way it is only natural to suppose that an analogous process exists to produce active hydrogen. In other words, the existence of an oxidase system necessitates the presence of a reducase system. All we know of a reducase system is that *in vitro* an extract of liver in the presence of an aldehyde will convert methylene blue into its leuco-base owing to the free hydrogen that is formed.

McDonagh has prepared a di-ortho-amino-thio-benzene, which he calls for short intramine. Although he believed himself the first to prepare this sulphur compound, he later found that B. Hofmann had prepared it in 1879 and in 1887 by oxidizing ortho-amino-phenyl-mercaptan with ferric chloride. K. Hofmann, the son of the former, in 1894 also prepared the same body by heating aniline with sulphur. Both father and son were working on the thio-anilines at the time, and neither prepared the substance for any therapeutic purpose. The same thing happened to Ehrlich, as the compound from which "606" was synthetized was isolated by Béchamp in 1863.

Intramine is a pale-yellow crystalline body, insoluble in water, but soluble in ether, alcohol, and acetone. It is best put up as an emulsion in olive oil, in which it is suitable for intramuscular administration. A lecithin absorption compound of intramine can be prepared for intravenous administration. Ehrlich found that the *dosis tolerata* of salvarsan for rabbits was 0.1 gramme per kilo. Therefore, when several times that amount of intramine can be injected into a rabbit weighing only 85 grammes it will be clear that intramine is an absolutely non-toxic substance. The biggest single dose the author has given to a human being is 12 grammes, without any untoward symptoms arising; 3 grammes can be injected every third day with impunity. When compared with salvarsan, he found that in the primary and generalization stages salvarsan was superior to intramine, but that in the recurrent stages the opposite was the case.

McDonagh, realizing that metals act as oxidizing agents and non-metals as reducing agents, tried other metallic compounds to see if they would take the place of the arsenical products. As a result he found that certain colloidal compounds of iron and aluminum—namely, their hydroxides, which he had converted into emulsoids with glycine, gelatin, or albumin—when injected intravenously acted tolerably well in early syphilis, and they also had the effect of increasing the action of intramine. Colloidal iron and aluminum compounds have a very great advantage over the arsenical drugs, as they are non-toxic, but to obtain an action equal to, or superior to, that of salvarsan it will be necessary to prepare more strongly absorbed compounds than the hydroxides. Such compounds he has been able to prepare, but the dosage and the best method of administering them have yet to be determined.

He has treated over 80 cases of syphilis with intramine, and the results, if salvarsan be given first and then intramine in early syphilis, and *vice versa* in late syphilis, are very much better than those obtained with salvarsan when it first came out. Several cases have healed at once with one injection, when they remained practically uninfluenced by an arsenic preparation and subsequent treatment with mercury and iodides.

ULCERS NEW AND OLD: JEJUNAL FOR DUODENAL ULCERS.

Under this title BLAND-SUTTON (*Lancet*, Feb. 19, 1916) writes in his customary vivid style. We know that chronic ulcer of the duodenum is a common lesion. For some undiscovered reason the ulcer in the majority of instances is situated within 2 cm. of the pylorus, and as a rule on the anterior wall of the duodenum, midway between its upper and lower borders. A chronic ulcer in this position is rarely accompanied by physical signs, but it sets up symptoms so easily recognized that there is no reason for resorting to the ways of Zadig in order to read them. The duodenal ulcer often appears as a rounded depression in the mucous membrane with the muscular coat as its floor. In many a layer of thickened peritoneum forms the base of the ulcer; occasionally it rests on the pancreas, the liver, or the gall-bladder. An ulcer on the anterior wall of the duodenum may rest on the peritoneum covering the anterior abdominal wall. There is a serpiginous ulcer that persists for years, creeping round the duodenum, scarring at one edge and so deeply eroding at the other that the tissues forming its base are often diaphanous. The peritoneal surface of the duodenal bulb in such a case is often white with scars. Obstruction of the pylorus frequently complicates ulcers near the pylorus; it is caused by edema of the mucosa. This condition also occurs with an ulcer situated in the pyloric antrum.

Some of the most troublesome ulcers in the pyloric region can neither be seen nor felt in the course of a gastrojejunostomy. A small duodenal ulcer can only be detected when it involves the peritoneum and produces a tell-tale scar. These small ulcers cause paroxysmal pain and digestive discomfort, the symptoms of a "vext duodenum and an agitated pylorus." This neat epigram (unearthed by Moynihan) was framed nearly a hundred years ago by Sydney Smith, the brilliant writer and preacher, who studied medicine in Edinburgh, and later in life doctored his parishioners as a rural amusement.

The chronic ulcer of the duodenum is exceptional in another feature. In all regions of the body open to observation a chronic ulcer is liable to become cancerous, especially between the thirtieth and fiftieth years; this is the age-incidence of duodenal ulcer. We know that chronic ulcers of the leg, lupus patches, and gastric ulcers occasionally become cancerous, but this change in duodenal ulcers has never been proved, although they are some of the most chronic occurring in man. The author says he has long sought among the living, the dead, and in museums for a duodenal ulcer that had become cancerous; so far his search had been unavailing. Cancer arises in the duodenum, but not in the region that is the usual seat of ulceration. The frequency with which gastric ulcers become cancerous and the infrequency of cancerous change in duodenal ulcers are difficult of explanation. When cancer exists in the stomach small fragments detached by the churning movements are transported with the chyme into the small intestine, but an implantation cancer in the intestine above the ileocecal valve is unknown. Shattock suggests that shed fragments of gastric cancer would not escape tryptic digestion. The author agrees with him.

The jejunal ulcer that follows gastrojejunostomy is often called a peptic ulcer, a term implying faith in the opinion that it is produced by the action of gastric juice. This ulcer was described by Braun in 1899. It resembles the common ulcers of the stomach and duodenum and it has sharp edges, often so sharp as to look as if it had been punched out. It is a dangerous ulcer and occasionally perforates before protective adhesions have formed, and causes septic peritonitis that often has a fatal ending. Some peptic ulcers have thickened edges and run a chronic course.

A peptic ulcer causes pain in the epigastrium aggravated by the ingestion of food. The symptoms often resemble so closely those associated with a duodenal ulcer as to lead patients to complain that the pain and discomfort, for which gastrojejunostomy was performed, have returned. When a

jejunal ulcer follows anterior gastrojejunostomy there is often an area of tenderness and sometimes a definite swelling under the upper part of the left rectus muscle. There are no valvulæ conniventes in the first 4 or 5 cm. of the duodenum, and its wall is thinner than in the remaining portion; it is often dilated and forms the bulbus duodeni. A remarkable transformation occurs in the jejunum when the escape of chyme from the stomach is transferred, in consequence of gastrojejunostomy, directly into the jejunum. The wall of the jejunum receiving the impact of chyme ejected through the new stoma becomes attenuated, the valvulæ disappear, and the jejunal walls assume the peculiarities of the supra-ampullary segment of the duodenum. This change entails a liability to ulceration so common in the duodenum. Thus surgery, by changing the environment of a segment of the jejunum, has evolved during this generation a new variety of ulcer. The time required to induce a segment of the jejunum to assume the characters of the supra-ampullary portion of the duodenum will probably be determined by subsequent observations.

It is the common opinion that the duodenal ulcer is caused by the impinging of acid chyme ejected through the pylorus on to the wall of the duodenum. The features surrounding the origin of a jejunal ulcer following gastrojejunostomy seem to support the percussion theory, but so far discussions on the mode of origin of gastric and duodenal ulcers pay but little regard to the influence of bacterial action. Most of us believe the stomach to be amicrobic as long as it can expel its contents, but observations on the fluid found in the abdominal cavity of patients with perforated gastric and duodenal ulcers prove that it often swarms with pathogenic microörganisms, especially streptococci. These are introduced with food, and especially milk, wittily described as "our most polluted article of diet."

It is noteworthy that a jejunal ulcer is rarely seen as a sequel to gastrojejunostomy performed for the relief of cancer of the stomach. This may be explained on the ground that such patients rarely survive the operation long enough to permit a jejunal ulcer to form. It is established that a "peptic jejunal ulcer" may make its appearance six months after a gastrojejunostomy, or be delayed ten years.

Some surgeons attribute these secondary ulcers to faults of technique, or a method of suture different from that employed by the surgeon who criticizes the report; or the suture fails to completely control the bleeding from the cut edges of the gastric or the jejunal mucous membrane and a hematoma forms. There is very little evidence available for the incrimination of silk or linen threads; persistent sutures have rarely been found associated with secondary jejunal ulcers.

With an unobstructed pylorus, gastrojejunostomy cannot be relied on to cure a chronic duodenal ulcer, and as it exposes patients to the discomforts and risks of regurgitant vomiting and jejunal ulcers the author has gradually abandoned it as a routine method, and prefers to excise the pylorus and the segment of duodenum containing the ulcer.

It is difficult to describe with certainty the functions of the pylorus. That it delays the efflux or chyme cannot be denied, but the rapidity with which a foreign body is discharged from the stomach into the intestine indicates that its controlling influence is by no means great. Smooth foreign bodies under an inch in diameter when swallowed are soon propelled through the pylorus. In the course of operations the normal pylorus when first exposed is usually firmly contracted. A few minutes later it dilates and, except for the vein that marks the boundary between the stomach and the duodenum, the pyloric sphincter is not easily seen. When the pylorus is excised it usually admits the index-finger easily, but after the parts have been immersed in preservative fluids such as a mixture of alcohol and water, or formalin solution, they contract and the orifice is quite small. The examination of museum preparations gives a false idea of the size of the pylorus and also of its function.

Duodenal ulcers may be mere dimples in the mucous membrane; others (miscalled fissures), deeply eroded pits, or narrow ulcers extending through the mucosa to the muscular tissue. It is conceivable that when irritated by the passage of acid chyme a spasm is set up producing painful sensations.

The common form of dilated stomach, nicknamed splashy stomach, and which was mainly responsible for bringing routine gastrojejunostomy into disrepute, is worth some attention; the author believes it is caused in some cases by spasmodic closure of the pylorus. Just as the small painful ulcer or fissure of the anus leads to irritative action of the anal sphincter, often ending in dilatation of the rectum and the pelvic colon, so repeated spasmodic contraction of the pyloric sphincter will produce dilatation of the stomach.

When the conditions are favorable, excision of the pylorus, to surgeons accustomed to intestinal operations, is a simple matter. Favorable conditions mean a narrow and elongated pyloric segment of the stomach and the absence of adhesions between the pylorus and the liver, or the pancreas, or the transverse colon. The disparity in thickness of the gastric and duodenal walls is embarrassing to the operator, but with practice the difficulty disappears. Extensive adhesions to the pancreas or to the liver are a bar to pylorectomy. The supra-ampullary segment of the duodenum is occasionally much shorter than usual, and makes the suture of the cut end of the stomach to the duodenum a difficult proceeding.

In the method the author employs the abdomen is opened by a median supra-umbilical incision. The parts in the neighborhood of the pylorus are examined in order to verify the diagnosis. The condition of the stomach is investigated, as well as that of the gall-bladder. When the conditions are favorable for pylorectomy the vessels are clamped and stripped from the pyloric region of the stomach, the loose tissue between the supra-ampullary portion of the duodenum and the pancreas carefully detached, and all bleeding vessels secured with forceps. When the pylorus is sufficiently freed from its attachments a clamp is applied to the stomach, about 5 cm. from the pylorus, the duodenum is clamped beyond the situation of the ulcer, and the pylorus excised. This is the best stage of the operation in which to ligature the vessels, as they are well exposed and easily accessible.

The cut edges of the duodenum and stomach are sutured in the manner of an end-to-end anastomosis. The author always uses thin sterilized silk for this purpose and for ligatures. It is tedious and unnecessary to describe in detail the methods available for sewing the cut end of the duodenum to the hole in the stomach. It is like stitching a sleeve in a shirt; the clever sempstress varies her methods according to the material and the size of the garment. So with the surgeon. In a case of extensive resection the line of suture in the stomach was 6 inches across. Not wishing to imperil the safety of such a long line of suturing by joining the duodenum to it, the writer implanted the cut margins of the duodenum into a fresh opening in the posterior wall of the stomach. In spite of the careful ligature of vessels there is usually some post-operative oozing from the tissues in the wound area, and it is wise to drain for forty-eight hours. The abdominal wound is closed with through-and-through sutures, the fascia being brought into apposition by intermediate sutures of thin silk.

The first patient Bland-Sutton subjected to pylorectomy for duodenal ulcer was a woman, aged thirty-five, at the Middlesex Hospital in 1909. Gastrojejunostomy had been performed three months previously, but the pain remained unrelieved. He excised the pylorus and the segment of the duodenum containing the ulcer. She made a quick and uneventful recovery. He has since lost sight of this patient. A few days later, when operating on a man for a duodenal ulcer, he found the conditions so favorable for pylorectomy that he excised the pylorus and the bulbus duodeni with the ulcer. Six years later he reëxamined him with the help of the *x*-rays and an opaque

meal, and found the gastric efflux satisfactory.

He has excised the pylorus for chronic duodenal ulcer according to the method described in 20 patients. In three of them he had previously performed gastrojejunostomy. In one the symptoms returned three months after the gastrojejunostomy, in another six years, and in a third two years. One patient, the sixteenth in the series, died. He was a man aged thirty-eight, transferred from Dr. Essex Wynter's ward to the author's with typical symptoms of chronic duodenal ulcer. At the operation an ulcer was found close to the pylorus on the anterior wall of a well-marked bulbus duodeni. The writer departed from his usual method and sewed the cut edges of the mucous membrane with catgut. The man made good progress until the fifth day, when his temperature rose to 103° F. He died on the nineteenth day after the operation. The suture line had sloughed in two spots. He attributed this unfavorable result to the use of catgut.

Since the treatment of duodenal ulcer passed into the province of surgery it has become the routine practice to perform gastrojejunostomy for its relief in the hope that by diverting the chyme through the new stoma into the jejunum the ulcer will heal. If the pylorus is obstructed by the ulcer the results are usually good, because the chyme must pass through the new stoma; but when the pylorus is patent the chyme flows through it and in some instances ignores the new route. The efflux can be watched with the help of an opaque meal and *x*-rays. The author believes it is better whenever practicable to excise the pylorus with the ulcerated portion of the duodenum on the principle of an end-to-end anastomosis. If this method could be made safe gastrojejunostomy for the relief of chronic duodenal ulcer with an unobstructed pylorus would soon be abandoned.

Experience proves that posterior gastrojejunostomy with an obstructed pylorus is a beneficent operation, in spite of the risk the patient runs of getting a new ulcer for an old one. The new ulcer has been evolved in this generation by alterations in the environment of the jejunum brought about by surgery.

WOUNDS IN WAR.

Bowlby (*Journal of the Royal Army Medical Corps*, February, 1916) after graphically describing the type of wound inflicted by modern weapons, discusses at some length the question of treatment, stating that we have the choice between the hypertonic salt solution of Sir Almroth Wright and the use of antiseptics, each of these having supporters. The object of each is the same in reality, for it is recognized by the advocates of both that it is necessary for dead tissue to be disintegrated or cut off as sloughs, and for granulation tissue to grow before healing can take place; and as one watches the blood-stained unhealthy discharge from the dead and dying tissues give place to the formation of pus by healthy granulations, one appreciates more clearly than ever before why the older surgeons spoke of "pus laudabile et bonum." They understood that when the velvety granulations and the creamy fluid appeared, destruction had ceased and repair had begun, and we recognize to-day, as they did, that there is such a thing as a relatively "healthy suppuration."

Bowlby thinks that those who prefer antiseptic to saline treatment have found that in war, as in all sloughing wounds and cellulitis of civil practice, nothing is so good as prolonged immersion in an antiseptic fluid; but unfortunately most of the wounds are not so situated that this is possible. When this is the case, then the next best thing is to employ constant irrigation, and very many wounds have done exceedingly well under this method, whether saline or antiseptic fluids have been used. But whatever fluid is employed, every surgeon knows by an experience which is far more valuable than any other source of information that good results in complicated wounds can only be obtained if the treatment of the wound is varied according to its conditions. It can only be ignorance of wounds that

would limit a surgeon to a single form of lotion, and it is the merest truism to say that in complicated and septic wounds a change of lotion or other application is as necessary as is a variation in the diet of the patient.

It has seemed that the period during which the saline hypertonic treatment is useful is strictly limited to the separation of sloughing and unhealthy tissue, and that once a granulating surface is obtained throughout it had better be abandoned, for it is generally painful, and if it is continued the skin becomes irritated, the granulations often become exuberant and flabby, and the healing process is correspondingly slow. The use of such well-tried applications as nitrate of silver and sulphate of zinc may well then prove more beneficial than that of the most potent solution of antiseptics or salines, for to treat wounds according to the daily report on their microbic infection, to the neglect of all else, is as foolish as it would be to treat every symptom of an illness rather than to treat the patient who is ill.

Within the past few months the treatment by solutions of hypochlorous acid has been most extensively tried, and the methods of producing it, advocated by Dakin and Carrel and Lorrain-Smith respectively, seem to most observers to be equally good. Personally, as far as the author has seen, there is nothing to choose between the two solutions, and he thinks that almost all surgeons are pleased with the results obtained in this treatment of wounds, and many have given up other methods in its favor. Where wounds of the hands and feet have been immersed in the solution they have cleared up with great rapidity, and where extensive lacerated wounds and bad compound fractures have been treated by irrigation, many patients have done extremely well. He thinks that wounds of this class have done better under treatment by hypochlorous acid than under any other, but they have not seemed to him to have become sterilized as rapidly as the cases recently described by Carrel, and he does not think that the good results he obtained were in wounds of the class he specially referred to—namely, extensive lacerations by shells and bad compound fractures. It was, however, his very decided opinion that the hypochlorous acid treatment was an important advance, and he found that it had to a great extent displaced other treatment in many of the casualty clearing stations. It is generally believed to have prevented the occurrence of gangrene in many bad lacerated wounds and to have arrested its progress in others; and, although he is well aware that it has not always been successful, he considers that it has already been productive of very much good, and that it is more useful in this class of wound than any other application he has yet tried. It is also a very remarkable fact that, unlike most antiseptics, it can be used in solutions sufficiently powerful to destroy virulent microbes very quickly without at the same time injuring the tissue cells. It should, however, be only used in solution, for if used as a powder it, like many other powders, is liable to form hard lumps which obstruct free drainage and so counteract its good effects.

SURGICAL TREATMENT OF GUNSHOT WOUNDS OF THE CHEST.

DAVIES (*Lancet*, Jan. 29, 1916) observes that the number of patients developing a hemothorax as the result of gunshot wounds of the chest is proportionately so large and our previous experience so small that this lesion becomes one of great interest. The blood in the pleural cavity in the patients who can be transferred to England is derived usually either from a vessel in the chest wall or from the lung; in some few cases a hemorrhagic effusion develops as the result of infection. It is rarely possible in the first two groups to recognize the source of the bleeding, and such being the case all patients must be treated as though the hemorrhage was pulmonary in origin.

The blood in the pleural cavity may be mainly fluid or consist of a massive clot; it may be complicated by the presence of gas or of a serous effusion or by infection.

Extensive clotting occurs chiefly in cases of shell or shrapnel wounds, either as the result of the extensive laceration of the tissues exposing the blood freely to the action of the tissue ferment and to broken fragments of rib, or from the introduction of portions of clothing. The clot is not free in the pleural cavity, but is attached, as a rule, firmly along one side, either around the broken fragments of a rib or at the point of entry of the shell fragment into the lung, where possibly some of the clothing has been detached from the metal; or to the diaphragm when the exit of the shell fragment is through that structure. *Per contra,* the blood in a hemothorax when caused by a penetrating bullet wound is mostly fluid. In the majority of these cases there is a deposit of fibrin, the amount varying in different patients. The fibrin accumulates mainly in the costovertebral sulcus and over the diaphragm.

Serous effusions develop most frequently as a complication of a hemothorax in which the blood is clotted and infected. Infection of a fluid hemothorax is as a general rule easy to diagnose; but the recognition of infection of a large clot, especially when complicated by a serous effusion, may be difficult. In many of these cases the source of infection is particles of clothing, and these form the center of the coagulum. Early and if necessary repeated exploratory puncture is essential to the successful treatment of these patients. Without it it is not possible to differentiate, in the majority of cases, between a simple pleural effusion, a hemorrhagic effusion, a fluid hemothorax, a clotted hemothorax, or at times an infected hemothorax. When done in the proper way there is no danger, no distress to the patient, and practically no discomfort. All that is needed is a good-class syringe, a small hypodermic needle, a second needle some 5 cm. in length with a correspondingly larger bore, and a small supply of novocaine. The infiltration of the tissues before introducing the larger needle into the chest is but a very slight complication of the procedure, while the effect, both mentally and physically, on the patients of the abolition of the pain from the stab through the pleura is very great indeed, and enables them to tolerate repeated explorations on the same or on a subsequent day with complete equanimity.

A small quantity of fluid blood in the pleural cavity may be rapidly absorbed; the lung resumes its normal relation to the chest wall and is unhampered in its movements. In such a case there is no need to interfere as the patient will recover completely. Larger quantities, a pint or more, must take longer to disappear; the rate of absorption varies greatly and may even be so slow that the processes of absorption appear to be arrested.

Even though the blood of a fluid hemothorax of moderate dimensions is after an interval of time apparently completely absorbed, and the lung reëxpanding comes into contact with the chest wall, the patient will not necessarily recover his former health and energy. One symptom, shortness of breath on exertion, will persist. This shortness of breath may develop and persist after the absorption and removal not only of a hemothorax, but also of a simple or tuberculous effusion or of gas, which has been present in the chest for some time. The symptom does not appear to have received the attention due to it, partially because the associated signs are few, and partially also because, the main cause of the trouble having been dealt with, the patient is freed of the chief causes of distress and has been able to resume light work. This shortness of breath is of the nature of a reflex condition dependent on the existence of an adverse ratio of the capacity for expansion of the chest wall and for expansion of the lung. Such a condition is particularly apt to occur when the lung, though able to expand, is hindered in the freedom of its movements by slight chronic thickening of the pleura, not necessarily universal over the surface of the organ. It would follow from this that in order to obtain the most successful results possible, it is necessary to adopt that form of treatment which will obviate to the greatest degree the organization of the deposited fibrin while

the lung is in a state of incomplete expansion; and there can be no doubt that the only treatment which is adequate is the early and complete removal of every considerable accumulation of fluid.

The fluid blood may be completely removed from the chest without discomfort to the patient, without the distressing symptoms of pain or cough, and without the danger of edema of the lungs, or recurrence of the hemorrhage, if the method which the author calls "oxygen replacement" is adopted. The essential of the method is that the intrapleural pressure, recorded continuously by a manometer, is under absolute control. The oxygen replaces the fluid as it is withdrawn and prevents the development of a high negative pressure, which is the cause of all the danger and distress. The apparatus consists of a glass container, with a capacity of about 25 Cc., having an opening top and bottom, and a third opening into the side low down. From a cylinder which is connected to the lower opening a stream of oxygen is allowed to flow through the container and escape at the upper opening. The lateral opening is connected by way of a filter to the needle which enters the patient's chest. Above the filter a three-way connection leads to the manometer; between this and the container is a tap which controls the admission of oxygen into the pleural cavity. As the aspiration proceeds and the manometer begins to register an increasing negative pressure, this control tap is opened and oxygen is sucked into the pleural cavity. The admission of oxygen can be regulated so that it corresponds exactly with the rate of aspiration of the fluid, maintaining a constant pressure. When all the fluid has been withdrawn the intrapleural pressure can be left equal to that of the atmosphere, or at any degree of negative pressure that may be desired.

After the withdrawal of the fluid there is in some cases a reaccumulation, serous in character; this may require a second or even a third aspiration with oxygen replacement. It will be found not only possible in so far as the patient's own comfort is concerned, but also advantageous, to leave a higher negative pressure than on the previous occasion, so as to exert greater traction on and consequently greater expansion of the lung. The production of such a negative pressure is, of course, permissible only when all danger of a recurrent hemorrhage has passed. The whole of the oxygen is absorbed within four days, becoming replaced in part by nitrogen and CO_2. When gas is present at the first or subsequent aspirations this should be replaced as well as the fluid by oxygen. The absorption of the oxygen is much more rapid than that of the other gases and helps therefore to maintain, and possibly in some cases to increase, the traction of the lung. This hastens the approximation of the visceral and parietal pleura, which is the surest way of preventing the reaccumulation of fluid.

Clotted but uninfected blood cannot be dealt with by this simple procedure. As it is necessary to remove the clot, an opening must be made through the chest wall. Adequate room can be obtained only by the subperiosteal resection of some 5 cm. of rib. The clot is detached and removed by some blunt instrument, and if there is no evidence to suggest infection the wound is closed. It is quite easy to stitch up the chest wall so as to prevent all leakage of air. The wound is sewn in layers, and the deepest stitches, which should be catgut, must include intercostal muscle, periosteum, and pleura; care being taken to avoid the nerve. At the end of the operation the pleural cavity contains air at atmospheric pressure; this is replaced by oxygen at a negative pressure equal to about 7 mm. of mercury. For this purpose the apparatus already described is used. The whole operation can be done under regional and local anesthesia if desired, and this is preferable to a general anesthetic if there is much displacement of the heart. As a general rule a serous effusion will accumulate in the ensuing forty-eight hours, and must be aspirated with oxygen replacement. There should be no risk of infecting a sterile pleural cavity by these operative procedures. The convalescence is much more

rapid and the recovery more complete than by the "wait and see" method.

A hemothorax which is infected must, as in the case of most empyemata, be treated by free drainage. The opening into the chest can be made through an intercostal space or through the posterior layer of periosteum after rib resection. The former method is most unsatisfactory. The interval between the ribs allows, in the majority of patients, of a small opening only, and it is consequently impossible adequately to explore the cavity or to remove clot or lymph when these are present, while the drainage-tube is too small to insure an unhindered escape of the pus and débris. There is danger, moreover, of wounding the intercostal artery when the incision is made—an accident which may not be immediately recognized—or of the tube later causing secondary ulceration into the vessels or necrosis of the rib by pressing on these structures. The operation of removing a segment of rib overcomes all these objections and takes only a very few moments longer. Both operations are equally practicable with local or regional anesthesia. The drainage-tube should be large; its inner end should project but a short distance beyond the parietal pleura and must not touch the diaphragm. Round the part which projects beyond the skin a strip of gauze moistened with some antiseptic should be placed to prevent a secondary infection of the track and of the empyema from the skin. For this same reason early removal of the drainage-tube is advantageous.

In those cases of hemothorax in which the blood forms a massive clot around an infected focus, but which are seen and diagnosed before the serum or secondary effusion has had time to become infected, the chest should be opened and the clot removed as described above. If after two or three days, however, the discharge has not become purulent, the drainage-tube can be removed and the wound allowed to close. After the wound is sealed up there will be a gradual collection of fluid in the pleural cavity, with generally some slight rise of temperature. This fluid must be aspirated with oxygen replacement and the aspiration repeated again later if necessary. The advantage of this method is that it diminishes the risks of secondary infection and of incomplete expansion of the lung, and therefore of chronic empyema and sinus formation.

Occasionally in cases of uncomplicated pneumothorax transferred to England, owing to some violent exertion in a patient recently injured, or even to some undetermined cause, the volume and pressure of the air increase after arrival. The rate of increase may be rapid and give rise to symptoms of acute distress requiring urgent interference, or it may be gradual. In the former type of case a valve-like opening is present; in the latter there is probably an area of damaged lung tissue which permits of a leakage of air at a rate slightly higher than that at which the gases can be absorbed from the pleural cavity. The damaged portions of lung heal in the course of time and the openings become obliterated, but in the meanwhile, if untreated, the increasing intrapleural pressure may become a source of great distress or even of actual danger to the patient, and must therefore be relieved. Rapid aspiration or the removal of sufficient gas to produce a negative pressure in the pleural cavity will reopen the pulmonary wound, and the relief thus obtained will be but temporary.

As an emergency measure, when the intrapleural pressure is endangering the life of the patient, a fine bore (0.5 mm.) hollow needle can be thrust into the pleural cavity; the intrapleural air under pressure will escape slowly, thus giving the patient great relief. If the symptoms are not so urgent, a needle connected with a manometer and with the outer air by way of a filter should be used; the needle is withdrawn when the inspiratory pressure reaches zero. The beneficial effects of this trifling procedure may be permanent in the mildest cases; it may last a few days or a few hours only. It is only in those cases in which a reaccumulation becomes serious after a matter of some hours that any other line of treatment

is indicated, viz., the establishment of a temporary fistula between the pleural cavity and the outer air. The most suitable instrument for this purpose is a hollow needle such as is used with the Record syringe, some 4 to 6 cm. long, according to the thickness of the chest wall, and 0.5 mm. in bore. This needle is driven through the chest wall, fixed *in situ,* and covered with a few layers of sterile gauze. The needle should be withdrawn at the end of twelve hours, but reinserted if necessary.

The acute pain, lasting often for a few days, due to a dry pleurisy, caused at times by the passage of a bullet through the chest wall, can be immediately relieved by separating the two pleural layers by gas. As the separation is required for a few days only, it matters little whether air or oxygen or nitrogen is used. Some 200 Cc. more than the quantity actually required to abolish the pain should be introduced so as to allow for absorption. Owing to the inflammatory condition of the parietal pleura it is more than ever necessary to anesthetize the track of the needle.

A CASE OF RESUSCITATION BY CARDIAC MASSAGE.

SICHELL (*British Medical Journal,* Feb. 5, 1916) reports the following case:

Private, aged twenty-two, was admitted on September 29, 1915, suffering from a severe gunshot wound of the left hand, received in France on September 26. A rifle bullet had struck the middle finger, almost completely severing it; the wound was very septic.

He was treated with hypertonic saline baths, and syringing with hydrogen peroxide, and the wound cleaned up considerably. As it was considered necessary to amputate the finger he was, on October 4, given a general anesthetic—a mixture of chloroform (two parts) with ether (three parts), and alternately pure ether on an open gauze mask. He was taking the anesthetic quite well, and was wheeled from the anesthetizing room into the operating theater.

He was lifted on to the operating table, when he suddenly became ghastly white, sweated profusely, and the pupils became widely dilated. Breathing continued slow and regular, but rather shallow. No pulse or cardiac impulse could be felt, or heart sounds heard. An incision a little to the left of the middle line was rapidly made into the upper part of the abdomen, and meanwhile hypodermic injections of strychnine and brandy were given, and a cloth wrung out of boiling water applied to the precordium.

The right hand was inserted into the abdomen, and a flabby mass, supposed to be the heart, seized through the diaphragm, and energetically squeezed. In a short time the flabby mass suddenly became hard—like a cricket ball—in the hand, and firm, regular, but slow contraction commenced. After a little these firm contractions became tremulous and threatened to cease, but on squeezing again became firm and regular; this routine was carried out several times, and at last a regular heart-beat and regular pulse were established. The patient began to strain and vomit, so that there was some difficulty in sewing up the abdominal wound. In about twenty minutes he was taken back to the ward, where a rectal saline injection was administered.

In the evening he suffered from considerable pain in the abdomen and chest, which was allayed by a hypodermic injection of morphine. He made a good recovery, and as it was deemed unwise to give him a further anesthetic the injured finger was eventually amputated by means of strangulation, with a piece of india-rubber tubing.

The man's general vitality was probably considerably lowered from septic absorption.

The movement of lifting him from the stretcher on to the table appears to have been the deciding factor in the cardiac failure.

The anesthetic was chiefly ether, the amount of chloroform being very small.

The subsequent pain was probably due to bruising of the diaphragm, and perhaps the heart.

Hypodermic injections of strychnine were of use once the heart's action was reëstablished, although obviously they could have been of no good whilst the circulation was stagnant.

UNILATERAL FUSED KIDNEY.

STEIN (*American Journal of Obstetrics and Diseases of Women and Children*, March, 1916) notes that the complete diagnosis of unilateral fused kidney includes the establishment of the existence of the fused organ, as well as its location, on the right or left side in the abdomen. The question may also arise as to the relative health and functional value of the fused organs, when the fusion is partial and incomplete. Flattened fused kidneys are especially liable to disease, as in Albarran's patient with pyo- and hydronephrosis of the upper half of the fused kidneys. Zuckerkandl also successfully resected the tuberculous lower segment of a long fused kidney.

Normally dystopic kidneys, and especially pathologically altered displaced kidneys, are very frequently mistaken for tumors of the internal genitals, including ovarian and uterine tumors, hydrosalpinx, pyosalpinx, and appendicitis. In other cases, dystopic kidneys have been suspected of being of intestinal, pancreatic, or mesenteric origin, or tumors derived from the bony pelvis. Erroneous diagnoses are sure to occur in some of the cases, which are apparently so simple that the possibilities of dystopic kidney are lost sight of. It is imperative, however, to include this condition in the range of diagnosis, especially as the modern functional tests and general methods of renal examination often permit the recognition of even difficult cases of dystopic kidney and also of fused kidney.

In a case reported by Huebschmann in 1908, the autopsy of a patient who had been treated for a long time unsuccessfully revealed the presence of a long fused kidney. The condition had been mistaken for a tumor of the liver.

The physical examination of the patient, including palpation and percussion, is of the greatest importance. In very stout or oversensitive individuals, or in patients with a deformed thorax, palpation naturally meets with difficulties. The discovery of a very large kidney on one side, which is not accounted for by a known pathological condition, and the non-discovery of the opposite kidney, is suggestive of a fused organ. It must be admitted, however, that palpation, in the majority of the cases, serves neither to establish the existence of a renal mass, nor the character of this mass as a fused kidney. Percussion of the abdominal region may help to determine the relations of the mass to the intestine, and its position behind or in front of the colon.

Having identified as kidney a hardened mass on one side of the abdomen, the examiner finds himself later on confronted with the still greater difficulty of recognizing a fused kidney. In the first place, it is necessary to exclude cancerous growths of the colon, which is relatively easy on account of the smooth, regular mass represented by the kidney; moreover, it is impossible to recognize intestinal tympanites above and below the mass. Cancer of the bowel is usually associated with hemorrhage and intestinal obstruction, and in the absence of definite functional signs can usually be excluded by means of radiography after injections of bismuth.

Movable liver or movable spleen is more apt to prove misleading. In women especially even a simple floating kidney and hepatoptosis are easily confused, and are often associated. A displaced liver is movable, and can always be raised to some degree; whereas a fused kidney is simply lowered, and usually fixed in its abnormal position.

In order to exclude a simple floating kidney, or a displaced organ, the presence of a kidney on the opposite side must be established. If a pathologically enlarged or hypertrophied kidney is found, it can be identified as a fused, double organ only through the most careful palpation of its contours. Following with the finger-tips successively the internal and external margins of the kidney, a series of inlets and

protuberances may be felt, representing the upper pole of the upper kidney, its hilum, its inferior pole, the groove which separates it from the lower kidney, and the corresponding portions of this kidney. While this may be possible in favorable cases of elongated fused kidney, the differentiation of a uniformly rounded fused kidney from a single kidney is naturally much more difficult.

Cystoscopy in suspected cases of unilateral fused kidney affords no information, on account of the invariably normal configuration of the trigone. The fused organ is always provided with two ureters, one for each kidney, and these ureters open normally into the bladder on either side of the trigone, whereas their entrance into the kidney is extremely variable. Catheterization of the ureters may prove serviceable and suggestive, for the pain felt by the patient when the capacity of the right and left renal pelvis is being tested will always be referred to the same side, no matter into which ureter the liquid is injected.

After the ureters have been rendered opaque by the injection of an impermeable liquid, such as collargol solution, or more simply, by the introduction of metal catheters, they may be examined radiographically. The diagnosis of unilateral fused kidney was made in this manner in Albarran's case, a woman fifty-four years of age. Both ureters were seen entirely on the right side; at a certain height, after leaving the bladder, the two catheters crossed and each stopped at a different level; in order to reach the renal pelvis, the lower catheter described an anteroposterior curve quite close to the kidney. Radiography is probably the only method which permits a certain diagnosis prior to operative intervention.

In the author's case the diagnosis was also established beyond doubt by means of this method.

Functional examination of the kidney according to modern methods may at least suggest, if not prove, the existence of unilateral fused kidney. Although the results of the tests, as practiced before all renal operations, are, of course, in themselves not sufficient for the diagnosis of a fused kidney, they are useful supplements to the findings of palpation, and especially of radiography, so that the total information in a given case points more or less conclusively to the existence of a fused kidney.

The diagnosis of unilateral fused kidney is often not made until the patient is on the operating-table. After its exposure a fused kidney is sometimes promptly recognized by its large size, its irregular form, and especially by the direction of the ureters, one ureter passing toward the opposite side of the abdomen. The arrangement of the renal blood-vessels is readily ascertained at the time of the operation.

Surgical operations for hydro- or pyonephrosis, stones, tuberculosis, etc., which enter into consideration in the treatment of unilateral fused kidney are: partial nephrectomy, pyelotomy, preferable to nephrotomy, decapsulation and nephropexy, and operations on the renal pelvis. The technique of partial nephrectomy must be modified to suit individual requirements. Nephrotomy is difficult for technical reasons, on account of the increased danger of hemorrhage, and is advantageously replaced by anterior pyelotomy. The usual operations, in cases of unilateral fused kidney, as not endangering the organ, are renal decapsulation and fixation (nephropexy). The remote results of these operative procedures are for the most part improvements rather than cures, especially as a successful fixation of the large and heavy fused organ is likely to meet with serious difficulties.

In case of a pelvic kidney, with a normal organ on the other side, extirpation may enter into consideration, the choice of the route (abdominal, sacral, perineal, or vaginal) being governed by individual requirements. The other method of liberating the pelvis from the obstructing kidney consists in laparotomy and displacement of the kidney into the large pelvis, followed by fixation.

The only possible method of clearing the pelvis from a displaced fused kidney in obstetrical cases consists in the transference

of the kidney into the large pelvis and fixation in its new position, after laparotomy. Expectant treatment is more advisable, however, in view of the risk of interrupting the pregnancy, as the intervention involves considerable dragging upon the uterus in order to provide free access to the kidney. In a general way, it is probably safest to induce premature labor at the proper time, or to perform Cæsarian section, when the child is living and the birth passages are greatly narrowed. Halban suggests that this might be followed at once by the transference and fixation of the kidney above the linea innominata.

RADIUM.

MORIARTA (*Medical Record,* March 4, 1916) considers radium a force and not a therapeutic measure. The three kinds of rays, to which the names alpha, beta, and gamma have been given, have well-defined characteristics and differences. Technically speaking, alpha rays are not rays at all, but are positively charged atoms of helium, with a weight four times that of an atom of hydrogen. They are liberated with an explosive force, and travel 12,000 miles a second. The energy of their liberation accounts largely for the heat of radium, and the force of their bombardment for the injuries to the tissues, such as superficial irritation, as well as burns of varying degree.

The beta rays are also not rays at all, but a negatively charged stream of electrons.

The gamma rays are not particulate matter, but a vibration of ether, similar to ordinary light. They do not polarize, pass straight by a magnet, and are not deflected by a prism.

In the use of radium externally it is necessary that the rays should be filtered to avoid superficial irritation and burns. By this we mean simply that the passage of certain rays must be obstructed by the interposition of some material or space that will absorb or stop the rays that are developed which we do not want to use. Alpha rays, being particles all traveling the same distance at the same time, are stopped by a slight obstacle, such as a sheet of paper. Beta rays show different degrees of penetration, being divided into soft, medium, and hard.

If one makes space the filter for these various rays, alpha rays are cut off by a distance equal to 3 cm. of air; beta rays, by about three times that amount; while gamma rays would reach a distance of 100 meters and still affect the electroscope, or travel 3 meters, penetrate a man, and cause a fluorescence beyond him. The ratio of penetration of these rays may be expressed by 1:100:10,000.

For the alpha and soft beta rays, one may make simple filters of lead, paper, rubber, or mica. Metals, however, furnish the common filters for the medium and hard beta and gamma rays; silver, aluminum, lead, brass, and more recently gold and platinum, are employed. One centimeter of lead screens the hard beta rays completely; gamma rays need 5 cm. of lead for what is practically complete absorption, although a small fraction will still be left with 10 cm. We thus vary the quality of the rays by filtration. Without filtration, there are 90 alpha particles to nine beta and one gamma ray. Under strong filtration, 600,000 total rays are reduced to 5000 (gamma) rays.

Mention should be made of still another class of rays which are created when a filter of lead is used in the application of radium: they are called secondary rays, are very irritating, and can be screened by rubber tissue of varying thicknesses.

After the nature of the rays and the kind and amount of filtration have been determined, the third factor in radiation is the density of the tissue to be radiated. A knowledge of all three facts is essential in practice; in fact, they absolutely control and determine the results of radium treatment when it is used externally, and when these factors are not well understood it is easy to account for the failures and disappointments in its external use.

In considering the use of radium, we will find that the alpha rays must in the main

be rejected therapeutically. Their discharge has been called "the most intense liberation of power in nature." Kinetic energy is their chief characteristic. As has been said, they account for the heat of radium, their chemical energy is shown in catalysis, and the rays are irritating and destructive to normal tissue. Soft beta rays are in much the same category; but the hardest beta rays, which are much more penetrating, are similar in effect on pathological tissue to gamma rays. In gamma rays, it is agreed, we have the most useful therapeutic agent of radium, as they will penetrate a great distance, though, as we have said, their number is relatively small. Our problem is to get the greatest amount of these rays in any given place. This will depend upon the intensity (amount of radium used), the manner of filtration, and the period or time of exposure. The intensity of an application is greatly augmented by what is termed "cross-firing;" this is simply the focusing of the gamma rays from several sources upon a given district; the burying of a tube will also increase its efficiency many times, because all the rays will thus become engaged, while if it lies upon the surface this is not the case, as only the rays emitted in the direction of the object can be effectual.

Gamma rays are shown to have a predilection for pathological cells, in proportion to their youth, embryonic state, or degree of development; the quantity of radium employed should be at least sufficient to affect the normal tissue. Young connective tissue, in the vicinity of the application, may be observed multiplying and developing vigorously. This is the essence of the favorable action of radium on morbid tissue: normal tissue elements are stimulated, while morbid ones wither and are gone. All observers have seen the wonderful power of radium to destroy growths of a simple and intermediate nature, from warts to non-infiltrating carcinoma. Large cell growths are simply "blown to pieces." New growths differ considerably as to their degree of resistance. Epitheliomata require larger doses than some other morphological tissue. The nearer the surface of the body the new growths are, the easier can they be destroyed, whether benign or malignant. Growths of the mucous membrane of the mouth require large doses and are quite difficult to cure. The effect of radium extends only to the depth of a fraction over an inch; therefore, a large mass to be attacked successfully must be carefully plotted with extensive direct radiation. If possible, a tube of radium should be placed in the tumor mass for a cross-fire. Applicators in the form of needles are here useful. The results of treatment may be complicated by an erythema, or even a severe burning, and by extensive edema. This is usually due to ineffective screening, or too long an application, where a large dose seems imperative. Toxemia from absorption, following prolonged treatment where there is no drainage, must be borne in mind.

Burns *per se* are not material if the desired result has been accomplished at the time they occur. They are ordinarily superficial, not very painful, and heal slowly. But if the further local application of this particular field is to be continued, then the early irritation or congestion must be recognized and radium application be discontinued for a time, otherwise sensitization of the skin will result and further treatment must be delayed indefinitely.

The physiological action of radium sounds not unlike a fairy tale. It often increases the red blood count one-fourth of a million in a short time. It stimulates all cell life, particularly that of the enzymes, thus aiding and improving metabolism. It increases the elimination of carbon dioxide, urea, and uric acid, and in addition is said to keep the latter in solution in the blood. It diminishes the viscosity of the blood and greatly increases the quantity of urine secreted. It stimulates and increases the appetite, and aids digestion by activating the digestive ferments. It dilates the blood-vessels, through the excitation of the vasomotor nerves. Its action in anemia is little short of marvelous, it relieves the pain and local manifestations of gout promptly, and also the pains of neuritis. It lowers blood-

pressure almost so surely as you administer it. It is a prompt and powerful tonic and stimulant. In larger doses it often produces a decided reaction, causing headache, nausea, lassitude, and general body discomfort. The cases in which this reaction occurs are thought surely to receive benefit from its use. No toxic or lasting ill effects have been reported.

The author records a variety of cases all extraordinarily benefited. High blood-pressure is controlled to a marked degree by internal administration. Arthritis deformans is reported as cured. Eight prolonged cases of myalgia or neuritis were cured by a single intravenous injection. Seven cases of nephritis with albumin, casts, headache, and shortness of breath also received complete relief. Gout also yielded to emanation treatment, whilst the results in local application of radium in malignant and benign growths were startling.

THE PRESENT STATUS OF GALL-STONE DIAGNOSIS BY THE ROENTGEN RAY.

O'BRIEN (*Boston Medical and Surgical Journal,* March, 1916) calls attention to a period when it was universally regarded as impossible to take gall-stones by the *x*-ray, and traces the gradual development of improvements until the publication of Cole and George's paper in 1915, who state that they can show gall-stones in all cases in which they are really present, and that a positive diagnosis can really be made in such a large percentage of cases in which gall-stones are present that the negative diagnosis has become far more important than it was previously considered to be.

In a later communication George insisted that success was only a matter of proper technique. In a series of 54 selected cases reported by him, which were operated upon by eight different persons, a positive diagnosis was made in 30 cases and a negative one in 24. There were three errors in positive diagnosis. No case negatively diagnosed was found to have gall-stones at operation. That the negative diagnosis was 100 per cent correct is exceedingly significant of the recent advance that has been made in the Roentgen diagnosis of gall-stones.

For preparation he believes catharsis valuable, and prefers an effervescing saline. The gas may very materially improve the definition of calculi. The patient should be fasting. Catharsis by mouth can be aided by an enema, so that if artificial gas distention of the stomach or colon be necessary, it may be performed profitably. A full bowel may at times be an advantage, as when bismuth filled, since it has a tendency to immobilize the gall-bladder.

Roentgenoscopy has absolutely no place in the direct diagnosis of gall-stones. Serial plates alone should be employed. The patient should first be examined prone, the abdomen on the plate with the shoulders slightly raised, if the patient be stout. Several of the plates should be taken with the patient in this position, and the patient may bend sharply to the left, directing the rays obliquely through the liver, using, if one wishes, the 8-by-10 piece of board as described by Pfahler to bring the gall-bladder closer to the plate, or the circular plate-holder of Cole, which can be pushed up under the gall-bladder for the same purpose. Such procedures are seldom needful. A fine-grained intensified screen is used. It is fundamental the patient should not breathe during the exposure. It is essential that one work with a soft tube that will stand up under repeated charges of heavy voltage. Usually the tube is in a plane parallel to that of the patient's body. A small diaphragm and a small cone are very important factors aiding one's success in looking for gall-stones. The plates should be read only when thoroughly dry. Direct illumination by the northern sky is often particularly helpful. Nearly all gall-stones contain a good deal of cholesterin, and calcium salts of the bile pigments may be said to be invariably present.

The more lime salts present in a calculus, then the more readily it shows up on the roentgenogram. There is usually a peripheral shadow, a so-called ring-formed shadow.

REVIEWS.

BLOOD-PRESSURE: ITS CLINICAL APPLICATIONS. By George William Norris, A.B., M.D. Second Edition, Revised and Enlarged. Illustrated. Lea & Febiger, Philadelphia, 1916. Price $3.00.

The subject of blood-pressure has been during the last ten years an exceedingly interesting source of medical information and our views concerning it have had to be modified from time to time. Possibly the most noticeable modification is a recognition of the fact that in most instances an estimation of the diastolic pressure is of greater importance than an estimation of the systolic pressure. Another important point has been the study of high blood-pressures in relation to the possible duration of life; and still another, the different pressures found in the various forms of valvular cardiac disease, with or without ruptured compensation.

When the first edition of Dr. Norris's book appeared two years ago there was a definite need for a contribution of this kind, and this need was, to a large extent, met by the text which he prepared. Taking it all in all, we think it is fair to state that the summarization of the scientific side of the subject is of greater value than the summarization of the clinical side.

An examination of the text of the volume shows that he and those whom he has associated with him are well informed in regard to the physiology of the circulation and the many forms of apparatus which have been devised for its study.

Concerning the matter of blood-pressure in the prognosis and treatment in pneumonia, Dr. Norris believes that Gibson's rule is by no means infallible, a conclusion which any one of considerable experience also must have reached. We are inclined to believe that careful study of the diastolic pressure in pneumonia will be of more value for the purpose just named than the systolic pressure, but, so far as we know, no considerable number of records of the diastolic pressure of pneumonia have been published. We do not believe that the experiments of Porter and Newburgh upon rabbits suffering from pneumococcic septicemia can be taken as conclusive in respect to the question of blood-pressure in pneumonia in human beings. Sufficient emphasis is not laid upon the persistence of sound in the brachial artery in auscultation in respect to aortic regurgitation, and our experience leads us to differ from the author in stating that this phenomenon is suggestive but not pathognomonic of aortic regurgitation.

Taking it all in all the book is an excellent one. We hope in the next edition that the author's personal experience will be more firmly impressed upon the text and that he will more frequently criticize or indorse the quotations which he makes from other authors. An illustration of the lack of personal criticism is to be found in the quotation as to the chief contraindications to the use of nitroglycerin, in which the somewhat surprising conclusion is arrived at that chronic nephritis with a very high blood-pressure and toxemia, as a rule, stands in the way of the use of this drug. This is certainly not the opinion of the great majority of medical men and should either be supported by some definite statement as to its accuracy, or else be accepted with an expression of reasonable doubt.

In the next edition, too, some attention should be paid to the index, which, at present, is lacking. Thus there is no reference under auscultation to the auscultatory method of estimating blood-pressure, nor is this method referred to under the name of Korotkoff; nor, again, does the word "phase" refer one to the text where he will find a description of the variation in sounds which take place in a vessel at points below systolic pressure.

THE MORTALITY FROM CANCER THROUGHOUT THE WORLD. By Frederick L. Hoffman, LL.D. The Prudential Press, Newark, 1915.

This exhaustive volume is dedicated to the American Society for the Control of Cancer, and to the American Association for Cancer Research. Its preparation was

instigated by reason of the fact that the author is statistician to the Prudential Insurance Company, and insurance companies are naturally greatly interested in a disease which is so common and which has so high a mortality. There are nine chapters and a considerable number of charts. The first chapter deals with the Statistical Method in Medicine; the second with the Statistical Basis of Cancer Research; the third with the Increase in Cancer; the fourth with Mortality from Cancer in Different Occupations; the fifth with Cancer as a Problem in Life Insurance Medicine; the sixth with Its Geographical Incidence Throughout the World; the seventh with Statistical Data of Cancer Frequency in American States and Cities; the eighth, Statistical Data of its Frequency in Foreign Countries. The ninth chapter deals with Some General Observations and Conclusions on the Cancer Problem. Thirteen of the charts show cancer mortality in various States and countries and also in the experience of the Prudential Company. The book is closely printed and provides an amount of information in regard to this important subject which cannot be appreciated until it is carefully examined. The author deserves the greatest credit for his exhaustive study of an important question of interest to all human beings.

THE PRINCIPLES AND PRACTICE OF PERIMETRY. By Luther C. Peter, A.M., M.D., F.A.C.S. Illustrated with 119 Engravings. Lea & Febiger, Philadelphia and New York, 1916.

The need of a book on the principles and practice of perimetry in the English language, long felt by students in ophthalmology, is supplied by Dr. Peter's excellent monograph. The author, as he states, has not endeavored to write an exhaustive treatise; he desires to furnish the student with a useful handbook, where he may find the chief applications of perimetry and the usual methods of employing various types of perimeters, and where he may acquire the necessary information to interpret the results. He has succeeded in these efforts. Doubtless in future editions the author will more fully analyze the results of modern perimetric investigation, to some of which he refers—for example, Rönne's work and his elaboration of the Bjerrum method, quantitative perimetry, and the reinvestigation of the fields in functional nervous diseases. As it is, Dr. Peter has very satisfactorily covered the ground, and his work is cordially commended. Of especial value is a very full bibliography, where the articles quoted are carefully classified, and many titles are inserted for those who desire to pursue this subject more fully.

G. E. DE S.

TOBACCO HABIT EASILY CONQUERED. How to Do It Agreeably and Without Drugs. By M. MacLevy. The Albro Society, New York, 1916.

We are not quite sure whether it is appropriate to notice this book in the columns of the GAZETTE. It is evidently written by one who does not approach his subject in a judicial frame of mind, but, for some reason, is inspired to attack the use of tobacco in a fanatical fashion. One portion of the book has chapters, or sections, bearing titles such as follow: Tobacco Causes Insanity, Tobacco Causes Cancer, Tobacco Causes Heart Failure, Epilepsy, Paralysis, Genital Weakness, and Apoplexy. The author does not bear a medical degree, but he has written other books, "Back to Life" and "The MacLevy System of Dumb-bell Training." As with most writers of this type, he quotes from various contributors to medical literature only those parts of what they have said or written which support his view, and without a sufficiently exhaustive statement of their opinions to convey the correct idea.

THE ART OF ANÆSTHESIA. By Paluel J. Flagg, M.D. Illustrated. J. B. Lippincott Company, Philadelphia, 1916. Price $3.50.

The title of this book is an interesting one in that it emphasizes that in the administration of a surgical anesthetic art, as well as scientific knowledge, is essential. The author is imbued with the correct idea that, as familiarity is prone to breed contempt, the anesthetist should never forget to approach each case with a certain degree of courtesy and respect, since the possibilities of success or failure are almost unlimited. In the preparation of his text the author has endeavored to present the subject in such a way as to be instructive to the

student, the interne, and the general practitioner. He gives a history of anesthesia, a classification of the stages of anesthesia, discusses the anesthetics commonly employed, and, in an important chapter, deals with the newer methods of medication preliminary to anesthesia. Altogether the book covers a little over three hundred pages, which is printed in large type of wide leading and, for this reason, is unduly bulky.

The author believes that in the light of present-day pathology chloroform should cease to be used as an anesthetic in obstetrics. He also thinks that it is well to combine it with ether. He strongly advocates its administration from a freshly opened container and in the prone position, and ends with the statement that the mortality is from one in one thousand to one in three thousand. We believe that the one in one thousand is far too high. This chapter on chloroform is, considering its importance, we think, distinctly disappointing. A very large number of illustrations are introduced to show various forms of apparatus, and these in some instances are more valuable than the text.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

These troublesome times have seen the discontinuance of such spectacles as football and cricket. Usually there is one of the final cup ties at football held either on the Saturday before Easter Sunday or on the following Monday. This year no such competition took place, and no crowd was therefore congregated at the football grounds. Our people, however, have found some other form of relaxation. Boxing displays still continue, and the Ring, situated in South London, is still patronized by those who remain. Beyond Barking there is a trotting ground which was never favored prior to the war, but since flat racing has been largely discontinued and the steeplechase season is over, these trotting matches are proving a great attraction. On Monday trains to Barking were crowded, and as the track is some little distance from the station, the taxicabs, which had accumulated in large numbers, were very busy transporting visitors to the contests. The local police were evidently looking the other way, for many taxicabs contained six or eight people going off in this direction. This is one of the few outlets left open to the betting fraternity, and these meetings, which were formerly neglected, have now turned out very successfully.

There was a queue at least 150 yards long waiting for admission to Madame Tussaud's. Large crowds were also to be seen on walking expeditions, some as far as Richmond and Uxbridge, whereas others were patronizing the open spaces in various parts of London, of which there are a large number. One of these is situated in North Hampstead, and is of special interest to medical men, in that it was the original country residence of Sir Spencer Wells, and contains a large Elizabethan house and about 80 acres of land adjoining. On his death the property was sold, and bought by public subscription for the public use. During the winter it was used as a headquarters of an artillery brigade, which was raised in Hampstead, and the ground very naturally shows traces of this occupation. It had evidently been a property of some standing, and was well wooded. The trees, however, were suffering from senility, and the recent gale had played considerable havoc with the elm trees, about twenty of which had measured their length on the ground. Some red deer are kept in an enclosure, and in another part of the grounds is a lake inhabited by a number of water-fowl, amongst which are two swans, which are called the "persevering swans," owing to the fact that last year they laid three sets of eggs and eventually hatched out one cygnet. On Saturday the park was fairly full, and khaki was by no means absent.

Passing through the outskirts of London on the bank holiday reveals the fact that there is still a very large number of young men who are not in khaki. This was particularly noticeable in the Whitechapel area and in the south of London in the neighborhood of Wandsworth and Camberwell. The majority of these had no badge indicating that they were war workers. It is explained that numbers of these young men are missed from their recruiting classes owing to the fact that they are lodgers and can move from one address to another without leaving any trace of their movements. No doubt some means will ultimately be found for tracing them, and an attempt is now being made by the new order that people liable to military service must produce their registration card, issued in August, 1915, on demand by certain authorized persons. It is quite obvious that numbers of these can certainly not be classed as physically unfit, and they will no doubt in time be brought to book.

I have in former letters commented on the occupations which have been taken up by women to replace men. It is more and more noticeable in connection with the railway systems, and again with the tram and bus services. In none of these occupations are the women acting as drivers, though many may be seen on delivery vans and driving light motor cars or wagons. They seem to be able to stand the railway work, such as ticket collecting and issuing, very well, but I learn that the majority are unable to persist for any length of time as conductors of buses, and that at the end of a month or six weeks they are obliged to give this up owing to the life being too strenuous. Nominally bus conductors have a rest at the end of each journey, when they are supposed to be able to get food and something in the shape of a cup of cocoa. Actually, however, owing to delays on the route and having to start off punctually on the next journey, the time is too short to allow for any definite rest, so that the rest periods are hypothetical, and the good results do not actually accrue. This is unfortunate, as the women conductors have already won golden opinions owing to their politeness and the efficiency of their work. It will be interesting to see in the future what other occupations turn out to be too strenuous for this form of labor.

So far as can be gathered without official knowledge, the tendency of the Medical Department of the War Office is to gather as many cases as possible into restricted areas. As a result of this a number of the smaller voluntary hospitals are being closed down, having served their purpose as stopgaps during the preparation of the larger bases. Truly medical cases are fewer than formerly, and have recently been generally of the type of rheumatism following exposure. During the past winter there has not been nearly so much frost-bite as during 1914-15, and the cases have been very much milder than during that period. On the other hand the functional element is rather marked. These cases recover very rapidly. There seems to be a general current opinion amongst the men that having been out in Flanders they have done their bit and ought to be allowed an easy time, while those who have not been out should be sent to replace them. This was well expressed to me by one man who had a functional gait, and who I had been encouraging to walk properly, in the words, "I see, sir, you are determined to send me out again."

A renewal of the suggestion of organizing small voluntary units for emergency work in this country has been made, more especially on behalf of the navy. Such units would consist of a surgeon, anesthetist, and two or three assistants with special knowledge of different branches of the subject, such as ophthalmology, medical work, or pathology, who will be liable to be called to any part at a moment's notice. The idea is to establish a form of clearing station to treat the cases immediately they are brought out of action. This has always appeared to be a rational method of organization, but hitherto has not been regarded with favor by the authorities, who insist on having permanent control of the individual and of his whole time.

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ORIGINAL COMMUNICATIONS.

THE DIFFERENTIATION AND TREATMENT OF SYPHILITIC AND TUBERCULOUS SKIN LESIONS.[1]

BY WILLIAM S. GOTTHEIL, M.D.,

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"Syphilis or Not Syphilis" is the suggestive title of a valuable little book written by a London dermatologist some years ago; and the idea that it conveys is of prime importance. At times this is one of the most difficult as well as important of the differentiations that we must make: Are we dealing with one of the protean manifestations of treponema activity, or with phenomena occasioned by the tubercle bacillus, or with symptoms caused by some other, possibly unknown, morbific agent. Our prognosis and our treatment both depend on the decision; and instances will readily occur to all of us in which failure in this elementary diagnosis has been fraught with disastrous consequences. The old and now abandoned terminology, "syphilitic acne," "syphilitic impetigo," "syphilitic varicella," "syphilitic pemphigus," etc., was a visible sign, in the earlier and less well developed stages of dermatological diagnosis, of the difficulties that confronted the physician. For syphilography and dermatology are indissolubly connected. The syphilographer must be first and foremost a dermatologist, since three-fourths of the phenomena of the luetic disease in its earlier and acuter and most important stages occur upon the skin and the visible mucosæ. The old and illegitimate connection between syphilis and genito-urinary diseases, based on the merely accidental fact that most of the inoculations of syphilis occur upon the skin covering the external end of the genito-urinary tract, is rightly falling into desuetude.

The first fact that confronts us in our consideration is that frank tuberculosis of the skin is comparatively rare in this country, whilst syphilodermata are very common. Lupus vulgaris, the best known type of tuberculosis of the skin, is much rarer here than in Europe, and is apparently getting less frequent year by year. Other forms of recognized skin tuberculosis are so uncommon that they are shown as rarities in dermatological societies. Further, there is a distinct group of dermatoses for which a tubercular origin is predicated by some authorities and denied by others; the evidence is still inconclusive, and the matter is still in doubt. The microscope helps us but little in these cases, and the various blood examinations and skin reactions, for reasons that will be gone into later, are weak staffs to lean on. The difficulties of diagnosis in certain cases may be so great as to be almost insuperable, as witness a case now in my service in the City Hospital of New York, in which an extensive ulceration of the genitals and buttocks, long under observation, is labeled with a diagnosis that swings from syphilis to tuberculosis and back again as temporary changes under the influence of time or treatment turn it one way or the other. (Fig. IX.)

I propose to consider first and briefly the features of those dermatoses that are admittedly tubercular and toxitubercular, as well as those that are supposedly of similar

[1] Read before the Associated Physicians of the New York Board of Health Tuberculosis Clinics, Feb. 9, 1916.

nature, and the syphilitic affections which they resemble and may be confounded with; and finally to discuss the means in our possession for the differential diagnosis of the two sets of conditions I have referred to.

There are not less than five generally acknowledged clinical forms of tubercular infection of the skin, two of which are common enough and distinctive enough to be readily recognized; the others are much rarer and more difficult to diagnose. Briefly described, they are the following:

1. *Lupus vulgaris,* appearing as reddish or brownish spreading patches of varying size; the patches consisting of deep-seated, soft, "apple-jelly" papules, nodules, and larger infiltrations, or hypertrophic tissue, and terminating in destruction of the affected area of skin with or without ulceration. (Fig. I.)

2. *Tuberculosis cutis verrucosa* (including verruca necrogenica, post-mortem or anatomic tubercle): Isolated papules or circumscribed aggregations of papules of varying size and shape, brownish or violaceous in color, warty or vegetating, and occurring especially on the extremities. (Fig. III.)

3. *Miliary tuberculosis of the skin:* A general eruption of small, brownish-red, conical papules, often breaking down to form sharp-cut ulcerations, and usually a part of a general miliary tuberculosis. (Fig. V.)

4. *Scrofuloderma:* A localized ulcerative tuberculosis of the skin and subcutis, secondary to tuberculosis of the lymphatic glands. (Fig. VII.)

5. *Tuberculosis cutis orificialis:* Tubercular ulcerations occurring on the skin near the natural orifices of the body, appearing as indolent, discrete, painless, progressive, rounded, shallow ulcerations, with miliary tubercles in their neighborhood, and almost always coincident with visceral tuberculosis. (Fig. IX.)

In addition to this there are several dermatoses apparently related to tuberculosis which have been designated "tuberculides" or "toxituberculides."

1. *Acnitis* (acne cachecticorum, acne varioliformis, acne necrotica): An indolent, persistent eruption of pin-point to pea-sized, firm, brownish-red papules and nodules, usually on the face, retrogressing by absorption, and leaving small pigmented, depressed scars behind. (Fig. XI.)

2. *Folliclis:* An eruption of indolent reddish papules, sometimes becoming vesicles, seated on the limbs, involuting slowly with the formation of depressed, adherent, horny centers, occurring in crops, and leaving depressed scars.

3. *Erythema induratum:* Chronic, circumscribed, purplish-red, nodular infiltrations of the skin, affecting especially the lower limbs, disappearing by absorption or ulceration, and leaving permanent pigmented scars.

Finally, and in a class by itself, is a very common affection the tubercular nature of which is assumed by some authorities and denied by others, without, at present, any positive evidence either way. I refer to

Lupus erythematosus: Well-defined reddish or reddish-brown patches covered with yellowish or grayish adherent scales, seated usually on the center of the face, progressing slowly, and ending in scar formation.

The chief differential diagnoses between these affections and the syphilitic lesions that resemble them are between lupus vulgaris and the tubercular syphiloderm, general miliary tuberculosis and the general papular syphiloderm, scrofuloderma and tertiary gummatous ulceration, tuberculosis cutis orificialis, and a like tertiary syphilitic ulceration. The other tubercular and toxitubercular affections of the skin are either so characteristic as to require no special elaboration of their differential diagnosis, or they resemble non-specific affections such as ordinary acne, and so do not fall within the purview of the present paper. Before going into the subject of the differential diagnosis of the affections mentioned, I desire to say a few words concerning some of the tests used and advised in both conditions.

In the first place it must be insisted on that the differential diagnosis between these non-specific and specific conditions must rest first and last upon their physical fea-

tures; it is unfortunate that some of these diseases are rare, and few of us have the opportunity to see many cases and acquire facility in their recognition. Nevertheless, a lupus nodule and a syphilitic papule are two absolutely characteristic and entirely different things, and so are a tubercular ulceration and a broken-down gumma; and the undoubted presence of one or the other settles the diagnosis, no matter what the laboratory test may show. For it must never be forgotten that a patient may have a Wassermann positive blood and still have a tuberculous affection of the skin; and conversely, he may have a definite syphilitic lesion, and yet be a tuberculous subject. There remain, however, certain cases of legitimate doubt, and these are the ones, and the only ones, in which laboratory tests are decisive. The tendency at the present time to rely on the laboratory for a differential diagnosis leads to much error, and is greatly to be deprecated.

(A) The Wassermann and Noguchi tests for syphilis. The trend among general practitioners at the present time is to regard these tests as decisive; given a positive result the affection in question is syphilitic. Leaving out of consideration certain minor points such as the few and rare conditions other than syphilis that give a positive Wassermann, a laboratory result of this kind only shows that the patient, at some time or other in his life, has had syphilis; it is no evidence in itself that the skin lesion under consideration is specific; it is absolutely valueless in diagnosis if the lesion shows distinct evidence of non-specific origin; and it is at best merely confirmative evidence if other signs of lues are present, and presumptive evidence if they are absent and the case is one of doubt. The now generally accepted fact that a patient who has once in his life had syphilis may permanently or temporarily have a positive Wassermann blood at any time shows the utter uselessness of basing a diagnosis on this factor alone.

(B) The tuberculosis tests—Von Pirquet, Calmette, Moro, etc. Before this audience of specialists in tuberculosis I approach this phase of my subject with some trepidation; but I think you will concede that the status of these tests is very much the same as that of the Wassermann. A positive result shows the presence of a tuberculous focus somewhere in the body; it does not, of itself, show that the skin lesion under consideration is of tuberculous nature. Like the specific blood test, it is confirmative evidence if the other factors point the same way, and presumptive evidence if these latter are entirely doubtful.

(C) The microscope. Here also we must exercise a wise conservatism and not accept laboratory conclusions without reserve. It is rarely possible to demonstrate the tubercle bacillus in tuberculous skin lesions; and the inoculation test, though more reliable, cannot be regarded as conclusive. Characteristic and early tuberculous lesions can indeed be differentiated from early syphilitic ones; but in the differentiation of the later chronic forms of both varieties of disease it leaves us entirely in doubt. It is impossible in most cases, for instance, to differentiate with the microscope between a tertiary syphilitic lesion and a chronic tuberculosis of the skin.

The readiest and also the most reliable means of differentiating tuberculosis of the skin from syphilis of the skin is by sight and touch; the history of the disease and the signs of one or other of these infections which we can elicit in the test-tube or under the microscope are secondary aids. Putting the commoner cases in tabular form before you we have the following points of differential diagnosis:

FIGS. I AND II.

Lupus Vulgaris.	*Tubercular Syphiloderm.*
1. Begins usually in childhood.	Begins usually after puberty.
2. Course very slow; takes years.	Course fast; takes days or weeks.
3. Nodules soft, yellow, apple-jelly like, deep-seated, not protuberant.	Nodules firm, brownish-red, and protuberant.
4. Ulcers superficial, irregular, with markedly undermined edges and slight discharge.	Ulcers deep, with sharp edges and much discharge.
5. Crusts scanty and reddish-brown.	Crusts large, greenish-black, and lamellated (rupial).
6. Concomitant signs of tuberculous disease; positive tests for tuberculosis.	Concomitant signs of syphilis past or present; positive blood test.
7. Scars hard, yellow, and shrunken.	Scars superficial, white, soft, and smooth.
8. Possible history of tuberculosis in patient and family.	Possible history of syphilis.

FIG. I.—Lupus vulgaris.

FIG. II.—Tertiary serpiginous syphiloderm.

FIG. III.—Tuberculosis cutis verrucosa.

FIG. IV. Tertiary tubercular syphilitic ulceration.

FIG. V.—Tuberculosis cutis, miliary form.

FIG. VI.—Secondary papular syphiloderm.

FIG. VII.—Scrofuloderma.

FIG. VIII.—Exulcerated gumma.

FIG. IX.—Tuberculosis cutis orificialis.

FIG. X.—Tertiary ulcerative syphiloderm.

FIG. XI.—Acne necrotica.

FIG. XII.—Secondary pustular syphiloderm.

FIGS. III AND IV.

Tuberculosis Cutis Verrucosa.	*Tubercular Syphiloderm.*
1. Lesion single, growth extremely slow.	Lesions often multiple, growth rapid.
2. Almost always on hands and forearms only.	Seated anywhere.
3. Dry and verrucous always.	Ulcerates frequently.
4. Color violaceous.	Color reddish-brown.
5. Never crusted.	Frequent crusting, perhaps rupial.
6. Possible concomitant signs of tuberculosis, tests and others.	Possible concomitant signs of syphilis.
7. Possible history of tuberculosis.	Possible history of syphilis.
8. Does not react to antiluetic treatment.	Reacts to antiluetic treatment.
9. Occurs chiefly in male adults who have been exposed to dead or living animal tissues.	Occurs in any one.

FIGS. V AND VI.

Miliary Tuberculosis.	*General Papulotubercular Syphiloderm.*
1. Extremely rare.	Very common.
2. Extremely chronic; takes years.	Course rapid; takes days.
3. Occurs mostly in children.	Occurs mostly in adults.
4. Ulceration and crusting common.	Ulceration and crusting rare.
5. Concomitant signs and test for tuberculosis.	Concomitant signs and tests for syphilis.
6. Usually follows a severe eruptive fever.	No such connection.
7. Does not react to antiluetic treatment.	Reacts to antiluetic treatment.

FIGS. VII AND VIII.

Scrofuloderma.	*Exulcerated Gumma.*
1. Occurs chiefly in children.	Occurs chiefly in adults.
2. Course extremely chronic; takes months and years.	Course much more rapid; takes days and weeks.
3. Occurs in connection with a chronic adenitis, most often around the neck.	Has no such connection.
4. Ulcer oval or rounded, edges thin, undermined, violaceous; base uneven and covered with flabby granulations.	Ulcer irregular, edges thick, reddish-brown, base irregular and hypertrophic, discharge abundant and gummatous.
5. Scars irregular, knotty and hard; tend to become keloidal.	Scars smooth, soft, and white.
6. Concomitant signs and symptoms of and history of tuberculosis.	Concomitant symptoms, signs, and history of syphilis.
7. Does not respond to antiluetic treatment.	Responds to antiluetic treatment.

FIGS. IX AND X.

Tuberculosis Cutis Orificialis.	*Tertiary Gummatous Ulceration.*
1. Extremely rare.	Very common.
2. Course extremely chronic; no tendency to healing.	Course more rapid; tendency to final spontaneous healing.
3. Seat always near a mucous orifice.	Seat anywhere.
4. Miliary nodules probable in base and neighborhood of ulcer.	No miliary nodules.
5. Concomitant signs, symptoms, and history of tuberculosis always present.	Concomitant signs of syphilis possibly present.

FIGS. XI AND XII.

Acnitis and Folliclis.	*Papular and Pustular General Syphiloderm.*
1. Seat on face and arms.	Seat on the general body surface.
2. Course extremely chronic, lasting years.	Course comparatively acute; lasts days and weeks.
3. Active and past lesions, in all stages, present at one time.	Lesions in practically one stage at the same time.
4. Lesions usually few.	Lesions usually many.
5. Concomitant symptoms, signs, and history of tuberculosis probably not present.	Concomitant symptoms, signs, and history of syphilis probably present.
6. Does not react to antiluetic treatment.	Reacts to antiluetic treatment.

This ends the list, so far as the differential diagnosis of tubercular and syphilitic affections of the skin is concerned. I have not touched at all, as foreign to the title of this paper, on the many non-luetic skin affections that may be, and I am sorry to say daily are, confounded with tuberculosis of the skin; nor have I by any means exhausted my more immediate subject. I found, as is so often the case, that the subject grew upon me as I wrote; and I might readily, if I have not already done so, exhaust my limits and your patience. I shall conclude with a brief consideration of the therapeusis of these affections.

THERAPEUSIS.

It is not necessary here to enter upon any discussion of the treatment of either constitutional syphilis or tuberculosis in general; their main lines are well known. A few words, however, about the local treatment, and especially about certain newer methods, may be useful.

Local Treatment of the Syphilodermata.—There is a marked tendency to neglect this part of the therapeusis and rely on internal medication alone. The most brilliant and quickest results are attained by a judicious combination of both external and internal medication. For isolated and non-secreting syphilitic lesions there is no better local treatment than the application of a well-fitted piece of mercurial plaster, or of one of the mercurial collemplastra, covered with ZO plaster to protect the clothing. Ulcerated, moist, or secreting lesions should be softened and have all crusts removed by soaking with a 2-per-cent salicylic acid-olive oil mixture, and then dressing with a 5- to 10-per-cent solution of oleate of mercury in oil. The official white precipitate ointment, strengthened perhaps with 1 to 5 per cent of unguentum hydrargyri, is useful in many cases. Bichloride wet compresses are usually too troublesome, and are liable to cause local inflammatory reactions that are undesirable.

Local Treatment of the Tuberculodermata.—Iodoform was much used at one time in the treatment of these affections;

but for various reasons it is an undesirable drug to employ, especially on the exposed parts of the body. Some one of the various forms of heliotherapy, and more especially the mercury vapor lamp, is the method to be advised to-day. A word of caution must be uttered, however, with regard to many of the so-called blue-light or therapeutic lamps that are on the market to-day. The ordinary bulb lamp, no matter what its so-called candle-power, is therapeutically useless; the amount of chemical rays that pass through the glass is so small that the claims made for the lamps are entirely unsubstantiated. A mercury vapor arc with rock crystal containers is necessary; the Finsen-Reyn, or the Kromayer lamp, or one of the modifications of them now made here, is essential for therapeutic action. Lupus vulgaris, tuberculosis cutis verrucosa, miliary tuberculosis, scrofuloderma, tuberculosis orificialis, acnitis, folliclis, may all be treated in that way.

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THE CAUSES AND TREATMENT OF STERILITY IN WOMEN.

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Sterility in the female is defined as inability to bring forth children, but for our purpose is understood to be inability on the part of a married couple to bring about conception; for there are many instances in which conception repeatedly occurs but the resultant pregnancies never mature, and sterility exists in spite of conception. Various types of sterility are recognized, viz.: (1) primary, (2) relative, and (3) secondary.

Primary sterility is that type in which the possibility of conception is precluded because of permanent congenital or developmental defects in the structure or function of the genital organs.

Relative sterility is a state in which the absence of conception is attributable to causes which are susceptible of correction. These causes, as we shall see, may be structural, chemical, functional, or emotional. It includes also those instances of so-called sexual incompatibility, in which a man and woman may live together in sterile marriage for many years, and each, after divorce or separation, subsequently enter into fruitful marriage with another person.

Secondary sterility, or what is commonly known as "one-child sterility," occurs in those women who fail to conceive after the birth of one child. It embraces only those in whom pregnancy is desired, but is prevented by structural changes which occur in the genital organs through puerperal infections or other complications of labor. It does not include those cases in which measures are adopted to prevent subsequent conception.

ETIOLOGY.

The causes of sterility in the female are to be sought in the husband as well as in the wife. This is a fact which cannot be too thoroughly impressed nor too well remembered. The physician who subjects a woman to an operation, no matter how slight, for the sole purpose of correcting sterility before he has carefully investigated the seminal fluid of her husband is guilty of a grave injustice to his patient. It is to be constantly borne in mind that in at least 30 per cent of the sterile marriages the fault is to be found in the husband. In the examination of 129 cases of sterility Hühner[1] fixes the responsibility of the man at 59 per cent. Reynolds[2] states as his belief that in nearly 50 per cent of sterile marriages the fault is to be found in the husband. In my own experience about 40 per cent of the husbands have been found to be sterile. I would like to emphasize that the statement of the wife as to the virility of her husband must not be accepted as *prima facie* evidence of his procreative ability. It must be remembered that copulative efficiency bears no definite relation to procreative power.

The causes of sterility in the female may be classified as follows:

1. Structural or physical.
2. Biochemical.
3. Functional.
4. Emotional or psychic.

The causes which are operative in a given case are frequently difficult to determine. In only a few cases can the sterility be attributed to a single, easily determined factor. In the majority of cases several factors are responsible, and can be discovered only after a thorough investigation. In the primary or absolute type of sterility the etiologic factors are usually easily detected, and consist of such permanent defects in structure as absent vagina or uterus, or the persistence of the infantile type of uterus. The underlying causes of secondary or one-child sterility consist usually in well-recognized changes in the structure, position, or secretions of the genital organs which result from infection or injury incident to labor. These two types of sterility, however, constitute but a comparatively small proportion of the cases. By far the largest number belong to the relative type, in which the underlying causes are frequently complicated or obscure and are discovered only after a most diligent and painstaking search. Even when studied most carefully these cases are often the source of keen disappointment and make us realize the limitation of our knowledge of the causes and treatment of sterility in the female. We shall consider each class of causes separately without attempting to demonstrate the relationship of one to another, for such an attempt would necessitate the study of innumerable combinations and would serve no definite purpose. It is far better to have a thorough knowledge of the factors which may be considered to be operative in a given case.

The *structural* causes of sterility to be found in the genital organs are best studied from without inward. They comprise those conditions which either prevent the sexual act, render it imperfect, or impede the passage of the spermatozoön toward the ovum. They may be divided into two groups—(1) congenital or developmental, and (2) acquired. To the first group belong such anatomical changes as are present at birth or result from faulty postnatal development, such as imperfect hymen, absent vagina or uterus, atresia of the vagina, infantile uterus, imperforate cervix, stenosis of the Fallopian tube, etc. It is only necessary to name most of these without further comment, for their recognition is not usually difficult. A tough unruptured hymen with a small perforation, while it may prevent coition, forms no absolute bar to conception because it does not impede the advance toward the ovum of highly motile spermatozoa which may be deposited on the surface of the vulva. This same statement applies as well to stenosis of the vagina. Flexions of the uterus, especially acute anteflexion, are frequently associated with a long, conical cervix having a narrowed canal, and a pinhole os. This combination is often cited as a cause of sterility. The factors in this combination which may be the cause of sterility are either developmental, physical, or biochemical. Uteri presenting these conditions are frequently found to be small and undeveloped. It would seem better to regard many of them as hypoplastic and associated with ovaries which are also hypoplastic, and unable to produce healthy, fertile ova. The physical hindrances to conception are claimed to be the forward direction of the cervix against the anterior vaginal wall and the stenosis of the cervical canal. Hühner maintains that conception is not likely to occur unless the semen is deposited upon the cervix near the external os, and that such deposition is difficult if the cervix has a marked anterior direction.

As to stenosis of the cervical canal it seems improbable that any narrowing of the cervical canal which is not of sufficient degree to completely obstruct the flow of menstrual fluid could, in itself, impede the progress of such a small, motile organism as the spermatozoön. The baneful influences of stenosis of the cervix are more likely to be found in biochemical changes in the cervical secretion due to faulty drainage, and these will be discussed below.

The acquired structural changes usually result from inflammatory processes or the presence of neoplasms which either occlude some part of the genital canal, or render the uterine mucous membrane unfit to retain or support the fertilized ovum. Infections of the genital organs in the female will account for a fairly large percentage of sterile marriages. Structural alterations in the uterus, tubes, ovaries, or pelvic peritoneum are to be found in most women who have been infected with the gonococcus. A chronically diseased endometrium, partly because of cellular change and partly from its toxic secretion, may either arrest the passage of the spermatozoön or present an unsuitable bed for the fertilized ovum.

The changes produced in the Fallopian tube by gonorrheal, tuberculous, or other infection which is inimical to the union of the spermatozoön and ovum, are either occlusion of one or both ends of the tube or loss of the ciliated epithelium of the tubal mucosa. Sterility due to tubal atresia is not as a rule difficult to determine, because a tube thus occluded is usually distended, tender, and prolapsed into Douglas's cul-de-sac, where it may be easily palpated. If it be true that the passage of the ovum along the tubal canal is due to the activity of the ciliated epithelium and that impregnation occurs within the tube, we can readily appreciate that the loss of the cilia might prevent conception through failure in the conveyance of the ovum to a spot favorable for its union with the spermatozoön. Loss of cilia, even if accepted as a cause of sterility, can only be surmised, for it may not be demonstrated by any known method of examination before the tube is excised and subjected to histologic study.

Physical changes in the ovary which may be the cause of sterility are either those which destroy the germinating epithelium or prevent the rupture of the matured Graafian follicle. An ovary subjected to chronic pelvic congestion from any cause usually develops a hyperplastic tunica albuginea which is tough and resistant. As a result, the successively matured Graafian follicles fail to rupture and appear as small retention cysts beneath the surface of the ovary. Such an ovary is found to be enlarged, tender, prolapsed, and freely movable. Organized fibrinous exudate upon the surface of the ovary or adhesion of the ovary to the surrounding viscera resulting from pelvic peritonitis will either prevent the discharge of the ovum or hinder its transit from the ovary to the tube. Even in the absence of such changes in the ovary, pelvic peritonitis and its consequent adhesions may be the cause of sterility by occluding the fimbriated extremity of the tube. The rest of the tube may not share in the inflammatory process. The starting-point of such a pelvic peritonitis may be disease of the appendix or other abdominal viscus. The previous history of the patient, in such a case, would shed much light upon the probable cause. This is especially so in "one-child sterility," in which the pelvic changes enumerated may have their origin in puerperal infection.

BIOCHEMICAL CAUSES OF STERILITY.

A most interesting phase of the subject of sterility in the female, and one which promises to shed much light upon its etiology and treatment, is that afforded by the biochemical researches of Hühner, Reynolds, and Lespinasse.[3] Hühner and Reynolds have studied the effect upon spermatozoa of the normal and pathological secretions of different parts of the female genital tract and have presented some very interesting data. The Hühner test consists in the examination of secretions from the vagina, cervix, and cavity of the uterus, beginning preferably within one-half and not later than one hour after coition, and continuing at intervals during the following twenty-four hours. First the mixture of semen and vaginal mucus is examined. In normal cases the spermatozoa remain active in the vaginal mucus for about one hour. When they have lost their motility in the vaginal secretions the cervical mucus is examined, and under normal circumstances should contain many active spermatozoa one hour after coition. At the expiration of three or four hours more the secretion from the uterine cavity is withdrawn with a specially

devised syringe, and when normal it should disclose the presence of a few actively motile spermatozoa. When active spermatozoa are found in the uterine secretion several hours after they have disappeared from the cervical mucus the test is said to be positive. Through the careful application of this test we may determine in which part of the genital canal the activity of the spermatozoa is too rapidly arrested. Acting upon the information thus obtained our search for the cause of the arrested motility and consequent sterility is more likely to be successful than by the haphazard methods heretofore employed.

If at the first examination of the mixture of semen and vaginal secretion no spermatozoa are found, the man is considered to be aspermatic; if many dead or feebly active spermatozoa are present their devitalization is to be sought in the reaction of the vaginal secretion. If spermatozoa reach the cervix in an active state and lose their motility in the cervical mucus, either the secretion of the cervix itself or that draining from the uterus is toxic. If they successfully pass through the vaginal and cervical canals but suffer arrest of motility in the cavity of the uterus, either the uterine or tubal secretions may contain the toxic agents. If repeated examinations of the uterine cavity disclose actively motile spermatozoa several hours after coition, the inference must be that the sterility (in the absence of organic lesions of the tubes and ovaries) is to be ascribed to deficient quality of ova.

Some of the alterations in the secretions which render them toxic to the spermatozoa are stated to be as follows: hyperacidity of the vaginal secretion; hypersecretion, inspissation, or infection of the cervical mucus and the presence in it of pus cells or pathogenic bacteria; the admixture of desquamated epithelium with or without bacteria in a thin, overabundant uterine secretion. The causes of such alterations are gonorrheal or other infections, deficient drainage from the cervical canal due to a pinhole size os, catarrhal changes in the cervical or uterine mucosa. The recognition of the cause is important if the proper treatment for correcting the sterility is to be instituted.

It has been proposed by Lespinasse to carry the biochemistry of sterility still further and to establish it upon a serologic basis. He explains the reason for this attempt as follows:

"It has been shown experimentally that spermatozoa, after coitus, penetrate into the abdominal cavity in large numbers. From here they are absorbed by the leucocytes, producing lytic bodies in the serum of the woman for spermatozoa and consequently rendering her sterile.

"It is also possible, but as yet unproven experimentally, that the secretions of certain women are normally agglutinative and hence destructive to the spermatozoa of one individual and not to another, thus accounting for those cases of sterility where both individuals have children by subsequent marriages. A recent test for paternity has been based on this formation of antibodies to spermatozoa. By it for medicolegal or other purposes the father of any particular babe may be determined. The test depends upon the fact that the mother and babe are sensitized to the sera or sperm of the male individual who produced the pregnancy."

FUNCTIONAL CAUSES OF STERILITY.

The perversions of function to which sterility may be ascribed consist of some not well understood processes, among which are changes in quantity or quality of the internal secretion of the ovary, disturbances in the inter-relation of the suprarenal thyroid and ovarian secretions. Such perversions or disturbances are considered to be present in those women who rapidly become fat and suffer amenorrhea. On this hypothesis may be explained the association of fat and sterility. Out of 215 cases of obesity, Kish[4] found 21 per cent sterile, and his observation coincides with that of other investigators.

Corpus luteum deficiency may exist without either amenorrhea or obesity and still be the cause of sterility.

PSYCHIC CAUSES OF STERILITY.

The relation of the sexual appetite and sexual pleasure in the sterile must be carefully considered as a whole, and especially in accounting for what is termed incompatibility as a cause of sterility.

While the evidence in favor of attributing sterility to absence of sexual emotion in women is not conclusive, there are some observations which would indicate that sexual pleasure and orgasm are powerful factors in aiding conception. In 69 cases of sterility investigated by Kish he found faulty development of voluptuousness in 38 per cent. Duncan[5] found the same condition in 31 per cent of his cases. Eulenberg[6] along with other students of this subject holds that while conception may occur if the woman is entirely passive, nevertheless active participation on the woman's part due to excitement is necessary to produce those reflex processes which render easy the passage of the spermatozoa into the uterus.

Of the reflex processes which may be assumed to accompany the orgasm, Vaertung[7] writes as follows:

"If one considers the sexual apparatus one sees that each and every part of it is concerned with aiding fertilization. While the whole process is not clear we may safely assume the following process to accompany orgasm: There is a peristaltic contraction of the vagina which holds the mass of semen against the mouth of the uterus. In these peristaltic contractions not only the vagina, the cervix, and the lower part of the uterus but also the entire uterus is apparently involved. The uterus during strong excitement, and assisted by the abdominal pressure, rises further into the pelvis, the mouth of the womb sinks lower, is opened by the uterine muscles, and ejaculates a small amount of secretion from the cervix. At the same time a sucking action is induced in the slightly opened mouth of the uterus which results in the introduction of some semen into the uterus. Rohleder[8] is of the opinion that this aspiration is the more powerful the greater the sexual excitement. In addition to this assistance must be added the action of the ciliated epithelium of the cervical canal. Summarizing the chief results of the voluptuous sensations we may note that they cause: (1) The contractions of the vagina; (2) reflex uterine activity with the corresponding aspirating action; (3) the mucous plug; (4) the activity of the ciliated epithelium; (5) an increased temperature of the entire genital apparatus."

TREATMENT.

The successful treatment of sterility in the female depends largely upon the recognition of its causative factors. Any case that seeks relief requires to be studied with infinite care in order to determine the cause or combination of causes which may be operative. Cognizance of the many complicated and baffling causes of sterility should make us hesitate to undertake its correction with the same nonchalance which has characterized most of our previous efforts in that direction.

An imperforate hymen, or one which though perforate is so tough and resistant as to prevent satisfactory sexual congress, should be either freely incised or exsected. A stenosed vagina should be overdilated under general anesthesia, either with the fingers or instrumental dilators. Subsequent contraction should be prevented by insertion of a large glass vaginal plug which should be retained for several weeks. A transverse partition forming an obstruction in the upper part of the vagina should be completely excised; the raw surfaces of the vaginal walls thus produced should be sutured to prevent the formation of adhesions and the possibility of a secondary atresia. The treatment of absent vagina with the object of correcting sterility will depend upon the condition of the uterus, tubes, and ovaries, and this is frequently difficult to determine except by direct inspection through abdominal incision. The construction of a vagina in these cases may be attempted if the other pelvic organs have been ascertained to be of normal size and structure. Sterility due to the persistence of an infantile uterus cannot be corrected.

For the purpose of overcoming sterility,

the treatment of acute anteflexion of the uterus associated with a cervix which is long, stenosed, and directed anteriorly should be undertaken only after careful consideration of the factors which are amenable to correction. Success will not result from any treatment of a small, hypoplastic uterus. Dilatation and curettement of the stenosed cervix are done for the purpose of widening the canal, securing good drainage, correcting the toxicity of the discharge, and producing a healthy cervical mucous membrane; all of these things may be accomplished, and yet dilatation and curettement, according to Kelly,[9] succeeds in overcoming sterility in less than 15 per cent of the cases in which it is done. What is the reason for such a large percentage of failures? In over 30 per cent of the cases the husband is aspermatic. In a fairly large percentage the uterus and other genital organs are hypoplastic and unfitted for conception. In some cases the cervical canal soon contracts again. In few, if any, cases do dilatation and curettement sufficiently overcome the angulation of the uterus and draw the cervix backward so that it may be bathed in the pool of semen which is deposited in the posterior vaginal fornix. In order to accomplish this, some additional operation, such as that of Dudley[10] for correcting the angulation, should be done.

If occlusion of the Fallopian tube is found to be the only barrier to the union of the spermatozoön and ovum, an attempt should be made to restore the continuity of the genital canal by operation upon the tube. The scope of this paper, however, will not permit of a detailed description of the many operative procedures which have been devised for the purpose. Salpingostomy with or without removal of a portion of the tube may suffice. Complete removal of diseased tubes without special attempt at securing a patulous genital canal has been followed by pregnancy. A woman, reported by Polak,[11] who had been sterile for many years because of gonorrheal salpingitis which developed soon after marriage, became pregnant shortly after a bilateral salpingectomy. I have recently reported two cases of pregnancy following bilateral salpingectomy, and have collected thirteen similar cases from the literature. In the surgical treatment of sterility caused by cystic degeneration of the ovary or inflammatory disease (other than abscess formation) in or around the ovary, the attempt should be made to preserve some of the ovarian tissue and attach it near the abdominal ostium of the tube.

Correction of the chemical and biological changes in the female genital secretions which are inimical to the health and life of the spermatozoa may be attempted by the following methods: Hyperacidity of the vaginal secretion may be neutralized by douches of alkalies, as sodium bicarbonate or sodium phosphate (Hühner), used just before coition; or by the introduction of suppositories of alkaline substances several hours before. The same treatment has been effective in the comparatively few instances in which the cervical mucus was found to have an acid reaction. Chronic purulent or mucopurulent cervical discharges which are found to quickly destroy the motility of the spermatozoa may be rendered less toxic by proper treatment. In the absence of laceration of the cervix and its sequelæ, such as hypertrophy and erosion, medical treatment will usually suffice to restore the cervical mucous membrane to a normally functionating state. This treatment may be pursued along well-recognized lines. In my own experience the best results have followed applications of compound solution of iodine to the cervical mucous membrane and packing the vaginal vault and cervical canal with an ointment consisting of ichthyol one part, wool-fat three parts, using one-quarter to one-half ounce at each application. This has yielded much better results than tampons or suppositories containing various medicaments in a glycerin base.

Only after a thorough trial of various methods should curettage be resorted to. All of medical treatment fails, however, in correcting the endocervicitis and its toxic discharges when hypertrophy, eversion, and

erosion of the cervix exist. These conditions demand appropriate surgical treatment, usually amputation of the cervix. A method of cervical amputation which I[12] have described and have employed in most instances has given me better results than the methods previously used. In those cases in which there is an associated obesity and amenorrhea, and in which the sterility appears to be due to lack of ovarian secretion, or to some disturbance in the relationship of the thyroid and ovarian secretions, satisfactory results are sometimes produced by the administration of dried corpus luteum substance (2 grains) combined with desiccated thyroid gland (¼ to 2 grains) three times a day. A rigid dietary and regulated exercises should be instituted. The lessons to be learned from a review of this subject would seem to be:

1. Sterility in the female may be due to many causes, some apparent and easily determined, others obscure and discovered only after careful investigation.

2. Surgical treatment for its correction should not be instituted until an honest and thorough investigation has shown that the sterility may reasonably be attributed to structural changes in the female generative organs.

3. No investigation can be considered complete which does not in some way include examination of the semen.

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HOW PHYSICIANS AND PHARMACISTS CAN CO-OPERATE IN THE USE OF AVAILABLE DRUGS.[1]

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The problem of supplying the necessary drugs for the cure and relief of the various ailments which physicians are called upon to treat is becoming increasingly difficult each day as the great world-war continues. Reports of the scarcity of some medicinal products grow continually more alarming and those who have followed the situation closely feel that perhaps "the worst is yet to come." Whether we take such a pessimistic view of the situation or not, the fact remains that many of the drugs which physicians have been accustomed to prescribe freely are now scarce, and consequently high in price.

Naturally there comes to us the question: "Why should so many drugs be scarce and high in price?" and while the answer invariably sums itself up into the statement, "because of the war," it is natural for us to dig deeper into the question and determine just how the war is affecting prices of drugs and chemicals, and what can be done to relieve the situation.

Physicians and pharmacists are expected to have the welfare of the public at heart, and to a major portion of the public that statement means supplying medical advice and prescriptions at as low a price as possible.

It is impossible to prepare and compound medicines without charging prices that are commensurate with the market value of the drugs contained in them. It may be possible, however, to lower the cost of medicines

[1]Read at the joint meeting of the Philadelphia County Medical Society and the Philadelphia Branch of the American Pharmaceutical Association, April 26, 1916.

if physicians will temporarily readjust their armamentarium and prescribe drugs which, while giving similar therapeutic action, are lower in price than some others which have been used previously. The selection of drugs used in treating diseases rests entirely with the physician, and after a prescription is once written and given to the pharmacist it is his duty to furnish the articles called for and nothing else, unless it is physically impossible to do so, and in the latter case it is the doctor who must decide what is to be used in place of the unobtainable substance. It is within the province of the pharmacist, however, to make suggestions which will tend to aid in relieving the situation, because his intimate touch with the drug market gives him first-hand knowledge as to what drugs or chemicals are scarce, unobtainable, or extremely high in price, and whether or not this condition is to continue. I do not for a moment mean to suggest that pharmacists wish to take it upon themselves to dictate to physicians what to prescribe at any time, for such is not the case, but the present situation offers an excellent opportunity for coöperation between the two professions to the interest of the public, as well as to their own interest.

In looking over the pages of the United States Dispensatory headed "Index of Diseases," we find under each ailment a list of the drugs which may be used in its treatment. Under some of these headings we have as many as one hundred suggested remedies. Surely, some of these could be eliminated at this time if necessary, and there would still be a sufficient number left to cover the needs of the practitioner. Most authorities agree that there are very few specifics in medicine. In fact, a public health official not very long ago stated that there were only three specifics known to the medical men, namely, quinine for malaria, six hundred and six for syphilis, and diphtheria antitoxin. Perhaps some of our medical friends feel that even this restricted list could be improved by the elimination of six hundred and six.

Of course it is possible that some single drug or chemical which is very high in price at present may be the only one that will answer the purpose in a certain case, but such instances will be few in number, and when they occur it will, of course, be necessary to meet the market price of the article, as is done in many cases at present when it is really unnecessary to go to such expense.

Our materia medica is such a large one and the armamentarium of most physicians is so small, comparatively, that we should find little trouble in adjusting things in some fairly satisfactory way to tide us over the era of high prices.

No doubt if this matter is discussed in gatherings such as this, numerous ideas will be brought out for meeting the situation, and it is the purpose of this paper to lead to a discussion in that direction.

It would probably be best for us to take a general survey of existing conditions with reference to drugs and chemicals, and then suggest ways and means for overcoming the difficulties which we may encounter. For this purpose we shall consider the subject under three headings, namely, vegetable drugs, inorganic chemicals, and organic chemicals.

Let us remember that before August 1, 1914, and perhaps for some little time after this date, we received shipments of dyestuffs, medicinal coal-tar derivatives, plant principles, crude drugs, and many other products for which we had learned to depend upon Europe, and particularly Germany, at frequent intervals and in any needed quantities. Let us further remember that Germany had spent years in building up this trade with us, and because of cheaper production costs, and because of inadequate United States tariff regulations, to say nothing of our antiquated patent laws, she had succeeded not only in building up her own trade, but in preventing any serious competition by manufacturers in this country.

We had been educated to use the things which Europe produced, and at the same time had been so busy supplying foreign countries with other products that we gave little thought to making ourselves indepen-

dent of Europe as far as medicinal chemicals and drugs were concerned.

The Situation Regarding Vegetable Drugs.—It is a well-known fact that certain drug plants can only be grown in climates particularly fitted for their propagation, and we are accustomed to speaking of plants as being "native" to this or that country. Experiments in drug-plant cultivation in recent years have shown us, however, that artificial conditions can often be created which will permit the propagation of certain plants in localities other than their native habitat.

It stands to reason that with the embargo on drugs issued by the several European powers and the lack of shipping facilities we are unable to obtain fresh supplies of crude drugs which are native to these countries. Of course we had a stock of these drugs on hand when the war began, but this has gradually been depleted, and in many cases is exhausted. American manufacturers of pharmaceuticals have been equal to the occasion, at least in some respects, for they have grown such drugs as cannabis, belladonna, hyoscyamus, stramonium, digitalis, hydrastis, and others in sufficient quantities for our consumption, and it is probably safe to predict that other needed drugs will be grown here this summer. As our stock of crude drugs became scarcer the market prices naturally advanced, and it cannot be expected that domestic production will return prices to their former levels because drugs cannot be cultivated as cheaply here as they can be bought from foreign countries. We must bear in mind that labor is much higher in the United States, and that the cultivation of a plant costs a great deal more than merely collecting it where it grows practically wild.

The Situation Regarding Inorganic Chemicals.—When we speak of inorganic chemicals in relation to their use in medicine, we mean that vast number of inorganic salts which have attained a prominent place in our materia medica and include, for example, the bromides, iodides, sulphates, chlorides, chlorates, etc., of the various metals. In the preparation of each of these salts we must have some substance which furnishes to us the metal, and some substance which furnishes to us the proper acid radical. Sulphuric acid, nitric acid, hydrochloric acid, and other acids have been and are produced in the United States in large quantities, and there should not be any shortage of these. We have our Louisiana sulphur beds to furnish the crude material for making sulphuric acid. Nitric acid is still made mostly from Chili saltpetre or sodium nitrate. Unfortunately we are having trouble in getting this substance because of a lack of ships, but Germany has taught us how to do without sodium nitrate and make nitric acid from the nitrogen of the atmosphere, and it is our understanding that a concern has been organized in the South which is about to undertake the manufacture of nitric acid in this manner. We have a plentiful supply of sodium chloride from which to make hydrochloric acid. Practically all acids are dependent for their manufacture upon sulphuric acid, and as long as we can make sulphuric acid we can make inorganic chemical salts, provided the proper metals are also available.

But in spite of the fact that we make sulphuric acid and other acids in an abundant supply their prices have gone up, and when acids go up in price their salts naturally follow suit. The reason for this increase is that sulphuric and other acids are used in the manufacture of explosives, and the exporting of acid to Europe has been so profitable that those who wanted to buy it for making salts had to pay "war prices" or do without it.

When we come to the consideration of the metals necessary to produce these inorganic salts, we find that iron, copper, silver, and lead are found in larger quantities in this country than in any other. Of gold, zinc, nickel, and cobalt we have more than enough to meet our requirements. We are only just beginning to use our deposits of other metals, such as bismuth, and as for our supply of halogens, we have the natural brine from the earth which furnishes chlorine and bromine, and our Pacific coast, or rather the ocean itself, is producing

annually for us great crops of kelp or seaweed which furnishes iodine. Iodine is also obtained as a by-product in the conversion of Chili nitre to nitric acid. Unfortunately, bromine and chlorine are now used in large quantities abroad in preparing asphyxiating gases for the gas bombs and grenades of which we read so much. This has created a demand for these halogens, and naturally has increased their market value, causing bromides to advance as much as 1000 per cent. There is also a brisk foreign demand for various metals, and here again the result is high prices.

The rôle of iodine in the war has been of a more kindly nature than that of its sister halogens. Its use as an antiseptic on the battle-field is universal.

Potassium is the metal which has caused us greatest difficulty. Practically the only readily workable potash deposits of any magnitude so far as known are located in Germany, and our supply of German potash salts is cut off entirely. Consequently these salts have been high in price for some time. We have supplies of potassium in the United States, but as yet we have been unable to devise satisfactory methods of extracting the potassium from the deposits found in the various sections of our country. Feldspar, a very common rock, contains considerable potash, but it remains as yet "unconquered." Alunite, another potash-bearing mineral, is being successfully worked by one of our new manufacturing enterprises. Tobacco stems, which were previously considered as so much waste, have yielded a goodly portion of the coveted metal in the past year, and from these various sources we have been able to supply some potash salts, but we have by no means met the demand. Salts of potassium are therefore very high in price.

The situation with regard to potash furnishes an excellent example of what physicians can do in the way of lowering the prices of prescriptions. It is well known that excepting for purely laboratory purposes the sodium salts can and will freely and admirably replace corresponding potassium salts. If, therefore, sodium salts will be prescribed where potassium salts were previously used, the situation will be ameliorated considerably. Medicinally sodium salts are believed to be even superior to potassium salts because the consensus of opinion accredits the potassium ion with a depressing action on the central nervous system and heart, while the sodium ion is perfectly inert and harmless. When a physician prescribes potassium iodide or potassium bromide he wants the effect of the iodine or chlorine radical; certainly not the effect of the potassium. If the chlorine and bromine can be conveyed satisfactorily in the form of sodium salts there is no reason why they should not be used, and their doses are practically the same.

The Situation Regarding Organic Chemicals.—In discussing the scarcity of organic chemicals our attention is first directed to the coal-tar derivatives such as acetanilide, acetphenetidin, salol, salicylates, benzoates, etc.

In the great iron and steel industries of the world vast quantities of coal have to be partially burned to coke. In this process large quantities of valuable by-products are driven off and can be collected and used for many purposes, both in the peaceful arts and in war. To our shame be it said that we have for the most part, by the use of the open beehive-shaped ovens, allowed these valuable by-products to escape into the air and be lost. One at least of the good things that the present war is accomplishing is to show us the folly of such insane waste of valuable material. The substitution of the open type of coke oven by the enclosed by-product recovery oven is now being generally undertaken.

Among the coke recovery products we obtain coal tar, and while we have in the past produced considerable quantities of coal tar and are producing more at present, we have never built up a coal-tar chemical industry, but have, with few exceptions, confined our efforts to selling the crude tar and the simpler derivatives generally known as intermediates.

German chemists on the other hand spent years in devising means of converting the crude coal tar into valuable organic compounds such as the synthetic dyes, and the

group of synthetic medicinal products so well known to all of us, and now either off the market or commanding exorbitant prices.

Unfortunately, coal tar and the coal-tar intermediates, while furnishing valuable medicinal products, are also the basis of high explosive compounds, and American capital and labor are busy just at present in turning out the coal-tar products necessary to keep up Europe's work of destruction, rather than in building up a coal-tar chemical industry.

The general attitude of American manufacturers seems to be one of "making hay while the sun shines." They are afraid of tying up capital in fostering an industry which, after the war, may be inadequately protected by our government against the influx of foreign goods which is bound to come, and judging by our present patent laws, tariffs, etc., there is ground for such a view of the situation. There is little hope of an immediate adequate supply of the coal-tar synthetics from domestic sources.

As for other organic chemicals used in medicine, we may point to the fact that our unmeasured cereal crops furnish us grain alcohol and ether; from our forests we obtain wood alcohol, acetone, acetic acid, rosin, and turpentine. We have also the raw materials for oxalic, lactic, citric, and tartaric acids.

There remains one important class of compounds to be considered, namely, the alkaloids and other plant principles. Many of these compounds have been made abroad exclusively, and are not only high in price but may soon be unobtainable.

There was a time in the history of medicine and pharmacy—and it is not so far back—when active principles isolated from vegetable drugs were practically unknown. In those days tinctures, extracts, infusions, etc., were used exclusively when drug preparations were desired, and they produced results.

Professor A. Tchirch, the well-known pharmacognocist of the University of Berne, Switzerland, has said:

"Under the influence of the successes of the modern synthesis of medicaments, we have been gradually abandoning drugs, in spite of experiments carried on for hundreds of years. Many physicians have already disaccustomed themselves to the use of drugs.

"How can one replace rhubarb by a solution of emodin, ipecac by emetine, opium by morphine, digitalis by digitoxin, ergot by ergotoxine or by the interesting bases isolated by Barger and Dale, which, according to the recent experiments of Kehrer, do not even act on the uterus? Emodin, emetine, quinine, digitoxin, and morphine are pharmacological individuals, different from the drugs themselves, and should be numbered among remedies not to replace the drugs, but to stand beside them."

A comparison of the percentage of increase in a few active principles and drugs based on a comparison of prices obtaining about March 1, 1916, and June 1, 1914, might be of interest at this point.

It must be borne in mind, however, that all price comparisons are more or less uncertain at this time, and the lapse of a few weeks, or even days, may make an enormous difference in the price quoted for an article. Between the dates mentioned

Granulated opium has increased	58 per cent.
Morphine has increased	16 per cent.
Codeine has increased	10 per cent.
Cinchona has increased	40 per cent.
Quinine has increased	180 per cent.
Coca has increased	20 per cent.
Cocaine hydrochloride	45 per cent.
Nux vomica has increased	33 per cent.
Strychnine has increased	67 per cent.
Aconite has increased	59 per cent.
Aconitine has increased	40 per cent.
Belladonna has increased	350 per cent.
Atropine has increased	1000 per cent.

These are only a few examples, and while they may not appeal to you as particularly striking in some instances, we must remember that, with a few exceptions, the crude drug stocks in this country at present are used to a much greater extent for manufacturing galenicals than for extracting active principles. There is, therefore, more danger of a shortage of active principles than there is danger of a shortage of drug preparations. The danger of shortage of galenicals is still further minimized by the

fact that many of our important drugs are being cultivated, as already mentioned. These domestic crops are not sufficiently large as yet for the extraction of alkaloids, but they do cover our needs for the manufacture of tinctures and other galenicals.

The great objection that has been voiced to galenical preparations in some quarters is that galenicals are not dependable because of the variation in active-principle content of drugs. Modern methods of drug cultivation, manufacture, assay, standardization, and preservation overcome this objection in a large measure, if not entirely. When a vegetable drug is assayed, either chemically or physiologically, or where possible by both methods, one may rest assured that the strength of that drug is known, and when such a drug is used to make a tincture, fluid extract, or extract, and the resulting product is again assayed, one may be assured that something is known of the strength of the finished product. Modern pharmaceutical methods carry us still further, however, for after completing the assay of a preparation we adjust its strength to standards given in the Pharmacopœia or otherwise recognized, and then the physician who prescribes a dose of 10 minims of a standardized tincture, or 1 grain of a standardized powdered extract, knows just exactly how much active principle his patient will receive.

Another objection to the use of galenicals which is advanced occasionally is that their taste is unpleasant. Let it not be forgotten that the pharmacist is still capable of compounding medicines and suggesting means of disguising their unpleasant taste. If asked, he will suggest suitable adjuvants, diluents, and flavoring agents to disguise the taste of tinctures. He will recall to the mind of the doctor that the doses of fluid extracts are so small that it is often convenient to incorporate them into a pill mass, and that this mass can either be divided and enclosed in capsules, or divided and rolled into pills which can be coated to preserve them until used.

Again, standardized powdered extracts of drugs give very satisfactory results, and mixed with sugar of milk, or some other diluent, they can be put up into capsules just as easily as active principles can be similarly dispensed.

Of course galenicals cannot replace active principles for hypodermic use, and in cases in which the crude drug is scarce, or commands exorbitant prices, it may be advantageous to use the active principle for oral administration also. Taken on the whole, however, the writer believes it would be of considerable advantage for physicians to prescribe galenicals wherever possible, in place of the active principles of drugs, for the time being.

The months which have hurriedly passed since the outbreak of the European war have witnessed marvelous efforts and results toward making our country independent of others in supplies of drugs and chemicals, but Rome was not built in a day, and neither was Germany's chemical industry. Patient effort, confidence in the future, and some assurance of governmental protection and aid are needed to build up our industries in this field. In the interim we must make the best of the situation.

It seems that the furnishing of material used exclusively in the treatment of disease cannot be disassociated from ordinary commerce, and is therefore subject to the practices of war and the arbitrary rulings of belligerents. Every one of us here feels that such should not be the case, but these conditions will never be altered unless we coöperate in testifying to what extent the work of healing is now hampered by the lack of proper therapeutic agents.

It is reported that on rare occasions Germany has raised her embargo and Great Britain has granted a permit enabling the importation of limited amounts of much-needed drugs, thereby recognizing the humanitarian principle involved. Could we not unite in asking that such occasions be brought about more frequently?

Let us as physicians and pharmacists coöperate in adjusting our materia medica to the conditions of the hour, but let us at the same time endeavor to obtain recognition for the principles of humanity as above those of Mammon and war.

EDITORIAL.

DIET AND RENAL DISEASE.

Readers of the THERAPEUTIC GAZETTE will recall the fact that on a number of occasions we have raised the question in these columns as to whether it is essential or wise to place all cases of chronic nephritis on a rigid non-nitrogenous diet. We have taken the ground that in a goodly proportion of such patients such a course is unwise, since it is advantageous to maintain the nutritional equilibrium if possible in every one, and also because it has yet to be proved that a non-nitrogenous diet is essential, and, again, the use of a moderate quantity of protein food serves to maintain strength and to compensate for the loss of albumin in the urine. We think that the readers of the GAZETTE will be interested in a contribution which is made to the *Edinburgh Medical Journal* for April, 1916, by Boyd, in which he shows very conclusively that a decision as to the use of a non-nitrogenous diet is to be reached, not by an examination of the urine, or even by an estimation of renal activity through the use of different tests, but by an estimation of the blood nitrogen which is present. Concluding his article he uses these words: "In chronic nephritis dietetic treatment must largely be governed by an estimation of blood nitrogen. If there be no nitrogen retention it is inadvisable to keep the patient on a strict non-protein diet, as nutrition suffers. Short periods of nitrogen-free diet are often useful and beneficial to the renal function and the cardiovascular symptoms, but the patient's nutrition must always be kept in view." These sentences, it seems to us, are pregnant with meaning and deserve careful consideration, individually and collectively.

It will be recalled that nitrogen exists in the blood in the protein and non-protein form. The protein form is found in the serum-albumin and the serum-globulin of the serum. The non-protein nitrogen is made up in greater part of urea, uric acid, and other bodies, of which the chief is urea. The estimation of the non-protein nitrogen of the blood by the older methods was more or less laborious and often erroneous as to results, whereas the plan introduced by Folin simplifies matters greatly. According to Folin and Dennis the non-protein nitrogen of the blood in health stands at from 22 to 26 milligrammes in 100 cubic centimeters, although these figures vary considerably when influenced by diet and in conditions of the kidneys which are not primarily renal in origin, as, for example, in cardiac disease with secondary renal congestion, when the non-protein nitrogen may be as high as 32 to 36. In cases of renal disease, however, the percentage is very much higher. On the other hand, it must not be forgotten that hospital patients, in particular, on entering an institution not infrequently receive so great an increase in animal food, over and above that to which they are accustomed, that there may be a very great increase in the non-protein nitrogen of the blood without renal disease being entirely responsible for it. Apparently we reach the conclusion, from Boyd's investigation, that the content of non-protein nitrogen is not to be considered dangerous or indicative of threatened uremia, or even of the necessity of cutting down nitrogenous diet, unless the percentage gets in the neighborhood of 50. If it is between 50 to 100 milligrammes per cent the patient must be considered as suffering from a very definite and serious nitrogen retention. Boyd shows this in an interesting way in some tables in which the non-protein nitrogen varied from 54 to 228. In all of the cases with high estimations death occurred. Boyd makes the important statement that in the non-protein nitrogen cases which show above 100 milligrammes per cent the duration of the illness may be reckoned in days, seldom in weeks.

In the further consideration of this subject Boyd also takes up the discussion of the relationship of nitrogen concentration in the blood and the cause of the uremic phenomena. He first points out that urea occurs in all the organs and tissues in the body except in the fat and the tissues of the

urinary tract, and that when its quantity rises in the blood the kidney cells are stimulated to increased activity. Furthermore, it has been shown to be a non-toxic substance when injected, unless the doses are enormous, indicating that urea is not the only, or the chief, toxic agent in uremia. On the other hand, it seems to have been shown pretty clearly that the difficulty lies in impaired oxidation of the purin group to uric acid. In the course of such imperfect oxidation methyl-guanidin is developed; that is a poisonous substance capable of producing death, with symptoms closely resembling uremia and eclampsia. So, too, creatinin when properly oxidized changes into methyl-urea, while when the oxidation is poor it forms methyl-guanidin. Boyd is careful to point out, however, that sometimes severe uremic attacks occur in nephritic cases even when an estimation of the blood nitrogen shows it to be so low that uremia might be thought to be little likely to occur.

This investigator also publishes an interesting table of 22 cases of various forms of nephritis, showing the relationship between the nitrogen per cent and the systolic blood-pressure. His conclusions are in accord with those of Folin, Dennis, and Seymour, to the effect that there is no definite relationship between high blood-pressure and the degree of nitrogen retention. Thus, in one case of blood-pressure of 220 milligrammes the blood nitrogen was only 41 milligrammes per cent, and in another case of 218 milligrammes the blood nitrogen was 60 milligrammes per cent. He therefore concludes that whatever toxic agent underlies the hypertonus of nephritis, it is not due to gross nitrogenous retention, and he makes the important observation that the mere existence of high blood-pressure is not a necessary indication for a strict non-protein diet. We have seen so many cases of nephritis in which the strength of the patient has materially improved when he has been allowed a fairly free protein diet that we wish to call particular attention to this observation of Boyd.

Concerning the relationship between blood nitrogen and renal activity Boyd is in accord with Folin, Dennis, and Seymour in finding that there is no correspondence between the results of the phthalein test and the degree of waste nitrogen retention. He publishes a table of nine cases of nephritis in which he shows that a considerable nitrogen retention is possible with a fairly active phthalein excretion, and that a low phthalein excretion may occur with a scarcely appreciable nitrogen retention. However, when nitrogen retention is above 100 milligrammes per cent the phthalein excretion in two hours is almost *nil*, whereas in health it will be remembered that from 80 to 90 per cent of it may be excreted in this time.

As a result of this investigation Boyd writes these conclusions:

1. That nitrogen retention does not occur in all nephritics.

2. That when the non-protein nitrogen of the blood rises to 50 mgs. per cent it is a distinct warning of grave renal inadequacy, and is an urgent call for rigid non-nitrogenous regimen.

3. That nitrogen values round about or over 100 mgs. per cent justify the gravest prognosis.

4. That there is no definite relationship between nitrogenous retention and high blood-pressure.

5. That the estimation of the non-protein nitrogen of the blood is of great clinical value as a guide to prognosis and to treatment in all cases of nephritis.

Boyd gives the following advice as to treatment:

"The treatment of nitrogen retention must be principally dietetic. When a nephritic with nitrogen retention comes under observation it is well, if strength permits, to withdraw all nourishment, satisfy thirst with distilled water, and administer purgatives. Considerable nitrogenous waste can be withdrawn by the bowel. Hot-air baths or hot packs are of value.

"After a period of twenty-four hours' rest non-protein diet is commenced, consisting of water-arrowroot, cream, sugar, and such stewed fruits as are poor in benzoic acid, *e.g.* apples, prunes, figs. This diet can be kept up for a week or even two weeks with-

out the patient suffering. It supplies sufficient energy for the bodily requirements, and if nitrogen retention is not excessive may cause a definite fall in blood nitrogen. At the end of the period milk may be added and more inspiring farinaceous foods than water-arrowroot. In the early stages of an acute nephritis, even when there is no nitrogen retention, such a diet is always desirable, for even though the kidney may be able to excrete waste nitrogenous bodies, in doing so it is working, not resting, and work is not good for an organ in an active state of inflammation."

Investigations of this kind are not only of value because they point the way to correct practice in individual patients, but they are also of value because they throw light upon a field which has hitherto been enshrouded, to a large extent, in darkness, and, again, because they emphasize the importance of associating physiological chemistry with clinical medicine if the proper guidance of a patient is to be attained.

ACETONURIA AND ITS INDICATIONS FOR TREATMENT.

Clinical investigation has within the last few years shown very clearly that acetonuria is a very much more prevalent condition than was generally supposed in earlier times. Instead of its being considered chiefly as a manifestation of advanced diabetes, it is now known to occur under a large number of diverse conditions, varying from postanesthetic chloroform poisoning to cases of pernicious vomiting arising from any cause; cases of starvation, voluntarily or involuntarily induced; fevers with considerable waste, or breakdown of the tissues of the body; and in certain cases of excessive diarrhea, as is frequently seen in infants during the hot summer months. It has also been found to be fairly constant in the severe acute infections, such as pneumonia and other febrile maladies. It has been suggested that whenever symptoms of so-called acidosis develop the patient is to receive by the bowel, by the mouth, or even intravenously and subcutaneously, solutions of carbohydrate substances, notably dextrose or levulose, in order that acidosis may be prevented by providing the body with so much foodstuff that it will not split and utilize its own tissues.

A number of papers have appeared within the last few months pointing out the value of this method of treatment in cases of "summer complaint" when the child has somewhat hurried respiration and a tendency to stupor, and still more recently a paper has appeared in the *Medical Record* of April 8, 1916, by Blodgett in which he records the results which he has obtained in investigating acetonuria in conditions other than diabetes. After pointing out that he has met with it in a marked form in all cases of severe vomiting, postoperative or otherwise, he expresses the belief that the symptom of vomiting is a result of the acidosis rather than its cause. Out of 44 cases of scarlet fever, which he considered in every way favorable to his investigations, there were 29 with a record of vomiting, and of these 27 had acetone in the urine. Among 15 cases that did not vomit there were 13 patients who had acetone in the urine. In measles there was practically no acetonuria, but in 18 cases of diphtheria, 8 of which had vomiting, 7 showed acetone. In 10 cases of diphtheria with no record of vomiting, 5 had acetone.

Simultaneously there appeared in the *American Journal of Diseases of Children* for April, 1916, a paper by Veeder and Johnston upon the "Presence of Ketones and Betahydroxybutyric Acid in the Urine of Normal Children." This paper is in the nature of a control and illustrates very well the necessity of considering the quantity of acetone which is eliminated rather than the mere fact of its presence, since, as we have already stated, it is becoming increasingly obvious that acetonuria is much more common than was thought at one time. Veeder and Johnston, as a result of their investigation, find that small amounts of ketones and betahydroxybutyric acid were always found in the urine of normal children, even when their caloric requirements were fully covered by a diet. Although the quantities

were small, nevertheless they could be readily estimated, the average amount excreted being, in each twenty-four hours, from 50 to 80 milligrammes. They found that age, sex, and body weight of the child apparently had no effect upon the amount, and that as a rule the amount of betahydroxybutyric acid was somewhat greater than the amount of ketones, although this did not always hold true. In other words, small amounts of these substances are to be considered normal and not evidences of a pathological condition. Veeder and Johnston even go so far as to emphasize the point that the large quantity of acetone bodies in the urine in febrile conditions and on restricted diets is due to an increase of substances normally present, rather than to the appearance of abnormal substances.

The mere presence, therefore, of acetone in the urine of a sick person or a sick child does not indicate that free feeding with carbohydrates is essential. If symptoms of acidosis exist, such as hurried breathing and tendency to stupor, and the reaction for acetone is very marked, this treatment may be essential, but otherwise it may be unnecessary.

Perhaps the most important part of these researches is to illustrate the fact that conclusions as to pathological states should not be reached; and treatment instituted in consequence, unless the physician is quite sure that the state which he has discovered was not present in a considerable degree when the patient was in health.

FRACTURE OF THE NECK OF THE FEMUR.

This injury, concerning which much new knowledge has come through the use of *x*-rays and through a more careful following of ultimate results, still remains one in which immediate treatment is often unsatisfactory, and one in which middle-aged and elderly men and women sustain permanent and crippling disability. Nor has treatment by abduction, by open operation, or by double and triple traction reached such a stage of perfection that in a given case, excepting in youth, any surgeon is reasonably certain of a good result. In this relation McGlannan's (*Surgery, Gynecology and Obstetrics,* March, 1916) study of the end results in 55 cases observed during the past eight years is of interest. Seven could not be traced. Of the remainder 17 are dead and four are helpless either on crutches or in wheel-chairs as the result of the fracture. There were 46 recent and nine old fractures in the series. Thirty-six recent cases were treated and 10 were not. Four patients died during the treatment, 13 were completely cured. Of the 36 recent fractures but five were subcapital (through the neck just below the head). The first, a woman seventy-one years old, was totally disabled for fifty-four days and partially disabled for four months. She was described seven years after her injury as living, well, and active, without handicap. The second was a woman sixty-five years old. She was completely disabled for nine months. She exhibited shortening, but was as well and active as before. The third was a schoolboy, sixteen years old, who was disabled 240 days. There was no permanent disability, and he died some four years later of pneumonia. The fourth was a woman seventy years old, who died in fifty-nine days of nephritis. The fifth was a woman fifty-six years old. She was incapacitated for six months, partially disabled for a year. Six years later she was reported as walking without crutches, with no shortening or stiffness of the hip, the major complication being obesity.

Lexer is quoted to the effect that the blood supply of the head and neck of the femur enters at four points: the first, an epiphyseal artery, at the insertion of the ligamentum teres; a second just at the line of junction of the head and neck on the upper surface; a third near the great trochanter; and finally, a metaphyseal artery near the lesser trochanter. Lexer states that the blood supply is greatest in childhood, and that in adult life the most marked change is seen in the diaphyseal group of arteries supplying the shaft, which

become smaller and smaller with advancing age.

All these arteries reach the bone by way of the periosteum and the capsule. Hence the importance of any attached and untorn area of these membranes is at once apparent.

Accurate approximation offers the best chance for a good union, diminishing the need for new bone formation, and thus giving the best opportunity for improvement in the local circulation. Reduction of a fracture is accomplished by downward traction and internal rotation of the femur, with the limb slightly flexed and widely abducted.

Whitman's forced abduction method has been condemned on the ground that the wide abduction is not required for all types of these fractures, and that overabduction would lead to malposition of the fragments. Operation demonstrates the fact that abduction is essential to apposition, and that after this point has been reached further abduction does not disarrange the fragments, because the taut capsule and other soft parts carry both fragments together to the limit of movement.

Impaction is usually a penetration with crushing and little fixation. Usually the bones are driven into one another with adduction of the limb. Union in this position therefore gives great deformity and is the cause of most of the disability incident to fracture of the neck of the femur. Though union takes place it is not a very useful one. Hence the impaction should be broken up by gentle hinge-like motion whenever there is hope of treating the patient.

In non-union of old fractures the head may be excised and the neck fragment or trochanter placed in the acetabulum, or the ends of the fragments may be freshened and put in apposition for bony union. Other alternative means are suggested that have not proved largely serviceable in practice. Subtrochanteric osteotomy is usually done when the fracture has united with deformity.

McGlannan's paper accentuates certain points concerning these troublesome fractures: First, that union and union in good position is possible; that there is as yet no standard method of treatment; that even when union takes place crippling is long continued; that union does not prevent permanent crippling; and that many of these fractures do not unite.

This paper does not call attention to the atrophy of the neck of the bone which takes place in subcapital fractures, even though these fractures be originally impacted in good position; nor does it deal extensively with the newer thought concerning the use of bone pegs with proper retention apparatus.

THE DIAGNOSIS OF FRACTURE BY PHYSICAL EXAMINATION VERSUS SKIAGRAPHY.

The ease and completeness with which fractures are diagnosed by the use of Roentgen rays, and the absence of any unnecessary traumatism incident to this procedure, have induced in the minds of those who have at their immediate disposal a modern surgical plant a neglect of those methods of examination on which the older surgeon had to rely entirely for his diagnosis, and on which even at the present day perhaps the majority of practicing physicians must still depend, since the transportation of patients to a surgical center is often difficult, at times impossible. The expense incident to the taking of an *x*-ray plus transportation may be prohibitive, and if patients be subjected to this inconvenience and expense with negative findings they may be left with a feeling of distrust in the judgment of the physician whose advice they have followed.

Skillern's paper (*Interstate Medical Journal*, April, 1916) upon this subject is therefore timely. He thus describes the humane and artful method of examining for fracture:

The patient is requested to be seated and to review the events which led to the injury. He is then asked if the limb has been fractured or diseased previously. After having visualized the mechanism of the injury from the narrative, the surgeon requests the patient to reveal the sound as well as the

injured limb. He then searches for deformity, and if this should be present the physical examination is forthwith terminated. This is an example of masterly inactivity. In the absence of deformity he is justified in running one finger-tip firmly along the most superficial portion of the bone until one spot is encountered where the patient "winces"—screwing his face up and involuntarily withdrawing the limb: wherever that spot is a fracture exists in 90 per cent of cases. Skillern prefers the term "wincing" to "localized" because it is so much more expressive. True "wincing" tenderness is almost pathognomonic of fracture, especially when combined with an accurate history of the mechanism of the injury. The patient does seriously object to the momentary pain of "wincing" tenderness.

Now right here the examiner should stop; he has made his diagnosis and should not shock the patient by further efforts. If he feels that he must elicit preternatural mobility and crepitus let him do so under nitrous oxide gas; the deformity may be reduced at the same time. The surgeon who reduces a fracture without an anesthetic, in the absence of a contraindication against one, is in the writer's opinion a brute. He cannot deliberate when the patient is conscious, and work without deliberation is not thorough work, and work that is not thorough is liable to lead to the court-room.

A skiagram must be considered merely as one of the many signs of fracture. Skillern records one case in which he requested seven skiagrams before the fracture was revealed graphically.

As to the diagnosis of contusion, he believes that herein lies one of the biggest fallacies of the day. Contusion of the bone is a rare traumatic bone lesion: difficult to recognize because it presupposes that every other possible bone lesion has been excluded both by physical examination and by skiagrams; rare because dispensary records show but few contusions of bone during the course of a year, but many fractures.

The average patient is not going to the trouble and expense of consulting his physician for a contusion, but either ignores it or treats it with the historic arnica.

Skepticism is expressed as to the existence of what is commonly called "sprain," these injuries when sufficiently severe being regarded as probably due to a spicule of cortex corresponding to the insertion of a ligament avulsed from the bone. This spicule may be too minute to be revealed by skiagraphy. The puffy wrist-joint which is so commonly spoken of as a "sprained wrist" is in reality a traumatic synovitis produced by overstretching the synovial layer of the capsule. All these cases are best treated by physiological rest such as that afforded by a splint.

In this article there is sound common sense. Skillern has called attention to the fact, well known to every largely experienced surgeon, that following trauma persistent bone tenderness usually indicates a break, bone tenderness being that elicited best by deep pressure, rather sharply localized and growing worse the longer the pressure is continued.

As a further suggestive sign of fracture, marked swelling is always to be considered. Bone bleeding is slow but continuous; that due to tear of the vessels in the soft tissues is more rapid, but is promptly arrested.

Finally, it is essentially wise, having made the general diagnosis, to refrain from further trauma until all preparations are made for reduction and retention, this being accomplished by open operation if needful, and as soon after the operation as practicable.

REPORTS ON THERAPEUTIC PROGRESS.

ANTIDOTES IN MERCURIC CHLORIDE POISONING—AN EXPERIMENTAL STUDY.

In the *Official Bulletin of the Chicago Medical Society* of April 8, 1916, FANTUS is reported to have said that the great uncertainty of interpretation of clinical results, coupled with the necessity of determining what antidote offers the patient the best chance for recovery, suggested his research.

The rabbit was chosen in this investigation, as this animal's inability to vomit enables one to rely upon the retention of the dose.

The mercuric chloride was administered in one-per-cent solution, by means of a stomach-tube, to rabbits that had not been starved. Choosing 0.04 gm. per kg. as the smallest dose that was followed by a reasonably short lethal period, average three days, the author performed a sufficient number of experiments (nine) to enable him to feel confident that he had a certainly fatal dose, and that the lethal period was not subject to great variation.

An important question that had to be settled as the next step in experimentation was to determine the influence of dilution upon the phenomena of poisoning; for, in giving the antidote, it is frequently necessary to introduce with it a considerable amount of water. The results of the experiments to determine this factor showed that dilution up to 1:1000 had no marked effect upon the lethal period.

The first step taken in testing a proposed antidote was to administer it mixed with the poison. Obviously, if the resulting mixture was found to be quite as toxic as the poison given alone, it was unnecessary to go further in the study of that substance. If, on the other hand, it was found that animals survived the fatal period by a considerable time, then the antidote was administered immediately after the poison had been injected into the stomach. If the substance proved of marked antidotal value when given immediately after the administration of the poison, then it was given five, ten, and fifteen minutes afterward, to see whether it is likely to be of use under the conditions prevailing in practice. The chief item to be noted in the estimation of results is the period of survival of animal after the poison was given. This is given in number of days.

While milk and serum-albumen solution gave no antidotal results, the majority of the animals survived when egg-albumen was given mixed with the poison. When egg-albumen was administered immediately after the poison was given, and without removing the stomach-tube, the average fatal period was 19.2 days. When, however, the antidote was given five, ten, and fifteen minutes after the poison, no antidotal effect was obtained. Inasmuch as these are the conditions that prevail in practice, we must conclude that egg-albumen is not likely to be of any value in the treatment of mercuric chloride poisoning.

Hall advanced the apparently ingenious suggestion of reversing Mayer's reagent for the precipitation of mercury. The author's experiments, however, showed that it has no antidotal value.

Alkali having been suggested as antidote, sodium carbonate and sodium bicarbonate were tried. Sodium carbonate has no antidotal value. With sodium bicarbonate a moderate antidotal effect was obtained. With sodium acetate a decidedly antidotal effect was obtained, ranking somewhat higher than that of sodium bicarbonate or of egg-albumen.

Lambert and Patterson recently reported on a highly successful method of treatment of corrosive sublimate poisoning, by means of which they scored 100 per cent recoveries in the ten cases treated by them. The treatment consists chiefly of a powerful appeal to the emunctories, a veritable washing out of the system. The drug used by them per stomach was potassium bitartrate. Experiments were performed which showed that potassium bitartrate has practically no antidotal value.

In view of the report of Macht, that

sodium sulphate was of value in phenol poisoning, and that sodium sulphate is an excellent deflocculent for proteids, it was tried; but gave perfectly negative results.

Calcium sulphide was found too toxic.

Thomas A. Carter announced in 1914 an antidote composed of sodium phosphite, six parts, and sodium acetate, four parts. The author first administered the sodium phosphite mixed with and following a fatal dose of mercuric chloride, without obtaining any antidotal effect. He then mixed it with a liberal excess of sodium acetate, which had previously been found to have an antidotal value; but found that the combination was devoid of antidotal action. Experimenting then with the proportions given by Carter, using 10 parts of sodium phosphite to 6.6 parts of sodium acetate, the author obtained a most gratifying antidotal effect, even if the antidote was given after the poison was administered.

Combination of sodium hypophosphite with sodium acetate in proportion of 10 to 6.6 gave a somewhat lower average than was obtained with Carter's antidote, 37.6 as compared with 42.2. An excess of sodium acetate, added to the hypophosphite, lowers the average lethal period, as it did in case of phosphite.

The best results of all were obtained with sodium hypophosphite to which a moderate amount of hydrogen peroxide was added (five times as much). The average lethal period, when this antidote was administered after the poison, was 43.4 days.

As the result of his studies, he would recommend the following treatment for mercuric chloride poisoning:

1. Immediate administration of antidote, *e.g.*, Carter's antidote, a tablet composed of sodium phosphite 0.36 gm. and sodium acetate 0.24 gm. If this be not available the author would give the following dose: Sodium hypophosphite, 1 gm.; water, 10 mils; hydrogen peroxide, 5 mils. If the amount of the poison taken be known, ten times as much of the hypophosphite should be given as poison was taken. This should immediately be followed by:

2. Copious gastric lavage with a 3-per-cent sodium bicarbonate solution, to which 0.50 gm. of sodium hypophosphite might be added. This may be followed by a dose of the antidote which is to be retained. This procedure should be repeated every eight hours, until no trace of the mercury can be discovered in the gastric contents by Vogel's test for mercury.

3. Egg-albumen water, 1 tumblerful every two hours. Sodium acetate, 2.0 gm. in a tumblerful of water with a tablespoonful of lactose every two hours. A tumblerful of one or the other is given every hour.

4. Continuous drop-by-drop irrigation of the colon with sodium acetate solution, 8.0 gm. per liter, interrupted twice daily by high colonic flushing with gallons of 3-per-cent sodium bicarbonate solution.

5. A hot wet pack once daily.

This treatment should be continued until the urine is free from mercury and remains so for several consecutive days.

PITUITARY EXTRACT IN OBSTETRICS.

KINNEAR states in the *Canadian Practitioner and Review* for April, 1916, that he has had both good and bad results with the use of pituitary extract in the first stage of labor, so that he now has abandoned its use for induction of labor and also before the cervix is dilated, or if he uses it does so with a certain amount of fear. [So has, and does, every one.—ED.]

It is in the second stage of labor that he gets the best results, especially if the patient is a multipara, and one only requires a few good strong pains to deliver the child. The child is born while the uterus is still acting under the effect of the pituitary, the placenta is detached quicker than usual, and the patient does not lose as much blood as formerly. Kinnear's experience is that one gets a good result if the child is born within a few minutes after its administration, but a bad result if the patient is delivered after the effect of the pituitary has worn off.

In cases of slight contraction at the brim, so that the head sticks above the brim, one may get a good or bad result from its use; good if the head comes through the brim

and is soon born, or delivered with forceps when the head is in the perineum while the uterus is still under the influence of the pituitary. If, however, the head does not come through, the uterus is apt (if the patient has been a long time in labor) to have tetanic spasm. If now one delivers with high forceps the prognosis for the child is not as good as if pituitary had not been given, and it is difficult to do a version. If one does a Cæsarian section after giving pituitary one may get a dead baby. If, then, there is some doubt about the head coming through with the pituitary do not give it.

In cases of retained placenta and postpartum hemorrhage Kinnear's experience has been good. The placenta usually soon becomes detached. For hemorrhage he usually uses ergot hypodermically, but where he has used pituitary it has quickly caused the uterus to contract and stopped the bleeding.

If a patient had a threatened or inevitable abortion would a hypodermic of pituitary have any effect on the uterus? Kinnear has not used it for this condition, but looking over the literature on this subject he finds that authorities differ on this point, some saying that it will convert a threatened into an inevitable abortion, others saying it has no effect on so early a pregnancy, as the uterus has not become sensitized to the effect of pituitary. Some uteri may become sensitized earlier than others, hence there may be some effect in one case and not in another.

In conclusion Kinnear says that in pituitary we have a very valuable extract that is of great benefit to the patient when properly used in properly selected cases. It is especially valuable to the country practitioner. It should, however, not be used in cases of contracted pelvis or in the first stage of labor, but only in the second stage, and if the child is not born within a few minutes one should deliver the patient with forceps before the effect of the pituitary has worn off, and thus prevent postpartum hemorrhage and also asphyxia or death of the child.

THE ABUSE OF PITUITARY EXTRACT.

In the *Journal of the Medical Society of New Jersey* for April, 1916, PRICE says he desires to urge upon the average practitioner the necessity for great caution in the use of pituitary extract. It would be wise for him to closely adhere to the following rules: Use the preparation of one reliable firm and stick to its use. Never give one Cc. for an initial dose; rather use one-third Cc. and repeat every half-hour. Do not administer it in primary inertia; it is better to give a dose of morphine and scopolamine, and after a refreshing sleep the pains will of themselves come on with renewed vigor. Always give pituitary extract before resorting to low forceps. Use it only in the second stage of labor and only when a distinct indication for its use exists. Finally, stick to the "terra firma" of established procedures; let those who have hospital protection do the fancy "stunts" and experimentations, and be not the "fool"—to enter "where angels fear to tread."

THE INDICATIONS FOR BLOOD TRANSFUSION.

KRIDA in the *Albany Medical Annals* for April, 1916, points out that the whole history of blood transfusion abounds in instances of fatalities following transfusion of incompatible bloods. Transfusion of animal bloods into humans retarded the development of transfusion for many years. Fatalities following the indiscriminate transfusion of human blood led three of the foremost surgeons of the last century—von Bergmann, Senn, and Gross—to condemn the whole procedure. Reports in the recent literature of accidents and deaths following transfusion are numerous enough, and represent probably only a small portion of the entire number of such occurrences. It is interesting to note that almost without exception these accidents occurred in cases in which no preliminary observations on the compatibility of the bloods for the proposed transfusion were made.

Ottenberg and Libman in a review of over 200 transfusions state: "In no case in

our series in which hemolysis or agglutination did not occur in the test-tube were any untoward symptoms observed which could be attributed to these phenomena. There were three cases in which agglutination of the donor's red blood cells by the patient's serum were observed in the test-tube. Two of these patients died shortly after the transfusion, and in the blood smears of both of them phagocytosis of the red blood cells by leucocytes was observed. . . . In the third case, the patient's serum was hemolytic to the donor's cells, and an extensive hemoglobinuria occurred after the transfusion, from which, nevertheless, the patient recovered." Lindemann in 135 cases reports one of hemolysis with negative laboratory findings, one case in which he had two conflicting reports from the laboratory, and one in which he transfused the patient a second time from the same donor, with five days intervening. He made no tests preliminary to the second transfusion, but subsequently there was test-tube hemolysis. In the light of Ottenberg and Thalheimer's research on agglutination in cats, this is easily explained. They show that cats frequently acquire an isohemolysin after transfusion against blood which was previously compatible. There were no deaths in Lindemann's series.

Experiment has shown that humans fall into four classes as regards the compatibility of their bloods, and that isohemolysins are inherited from either one or the other of the parents. Relatives therefore show less incompatibility than strangers, although it must be borne in mind that if, for instance, a sister is to be transfused with the brother's blood, either may contain isohemolysins from either of the parents. If the parents did not happen to belong to one of the four groups, the bloods of the children would be incompatible, according to Mendel's law, in 50 per cent of the cases.

This incompatibility may be readily determined by simple laboratory tests. Moss has shown that hemolysis is always preceded by agglutination, although agglutinin may be present without hemolysis. It has been shown that transfusion in cases in which the patient's serum agglutinates the donor's cells is dangerous. The converse of the proposition is not true to nearly the same extent, although it is questionable whether such blood can be considered of much value to the patient.

Peyton Rous and Turner have recently published a single method of testing for agglutination microscopically, which may be performed in a few minutes. Blood from the patient and prospective donors is obtained from a skin puncture, and collected in blood-counting pipettes which have been rinsed with 10-per-cent sodium citrate solution, and the solution drawn up to the mark 1. Mixtures of the patient's blood are made with that of the prospective donors in the proportion of 9:1, and 1:1. A drop of the mixture is placed on a slide, mixed with a drop of salt solution, and observed under the microscope. Agglutination is readily visible when it occurs, and is usually fully developed in two or three minutes.

Agglutination in the 9:1 mixture, with little or none in the 1:1 mixture, signifies that the patient's blood agglutinates the donor's corpuscles, and is unsatisfactory for transfusion. The converse may be determined by making a 1:9 mixture. Practically it will be found much easier to obtain the blood for these tests by venous punctures, as it readily clots in the pipettes.

To summarize, Krida concludes as follows:

Blood transfusion is indicated in—

1. Massive hemorrhage.

2. Marked secondary anemias, either as a palliative measure or as a preoperative measure.

3. Essential anemias.

4. Blood dyscrasias, if fresh human serum injections or thrombin are ineffective.

5. Chronic localized infections of demonstrable etiology not amenable to other treatment. Immunized blood should of course be used in these cases.

No blood transfusion should be undertaken without first making agglutination or hemolysis tests of the patient's and donor's blood.

THE TRUTH ABOUT SMALLPOX AND VACCINATION.

GAY in the *Boston Medical and Surgical Journal* of April 6, 1916, tells us that in these days there is no excuse for using impure vaccine virus. It is raised in young calves that have been carefully tested for those diseases to which they are liable. The process of vaccinating the animals is carried out with all possible antiseptic precautions. After the virus is collected they are immediately killed and examined for any diseased condition. If such is found, the virus is placed in cold storage for several weeks, during which time it is repeatedly examined and also tested upon guinea-pigs to ascertain its purity or efficiency.

For how long a period does a single successful vaccination protect an individual? It varies greatly in different persons. Many physicians and nurses who attend smallpox patients are protected by one "take." They usually repeat the operation occasionally as a precaution, but one "take," followed at once by another trial as a test, will protect a large number permanently. Yet, as a trial is the only sure test, it is well for all who have not been vaccinated within five years to repeat the operation on being exposed to smallpox. This is the most certain method of protection. As a rule, those persons who have had smallpox, or varioloid, do not need vaccination under any circumstances. There are very few deaths from smallpox among vaccinated persons, even when many years have elapsed since the operation. Complete protection, however, does wear out in a certain proportion of cases, hence it is safer to repeat the operation occasionally until it is demonstrated that the susceptibility has lapsed. The German method is reasonably efficient.

Primary vaccination should be done during the first year of life, as "cradle vaccination" causes comparatively little disturbance when properly performed. In adults the first vaccination with animal virus may cause considerable disturbance, but no permanent injury.

That diseases are not transmitted by vaccination in these days is evident from the fact that none exist in the animals from which the virus is taken. Furthermore, the affections alleged to be carried in that way, tuberculosis, tetanus, the social diseases, etc., are as common in the unvaccinated as in the vaccinated. Even in the old days previous to the almost universal use of animal vaccine, when the vaccination took place from arm to arm, it was the rarest of events for any affection to be conveyed in this way. Local infection in the shape of sore arms was common enough, as now, but systemic infection was almost unheard of. Careful investigation of the alleged serious results of vaccination usually showed that the trouble was due, not to the virus, but to the lack of care and skill in its performance and subsequent treatment.

It has been claimed that hygiene, isolation, and quarantine would control smallpox without resorting to vaccination. Experience proves conclusively that this disease is not controllable in this way. Without vaccination it is as prevalent among the hygienic as among the other sort—in fact, in the Niagara Falls epidemic, it was even more prevalent among the upper classes.

THE METABOLISM AND TREATMENT OF RHEUMATOID ARTHRITIS.

In the *American Journal of the Medical Sciences* for March, 1916, PEMBERTON reaches these conclusions:

1. The general conclusions already published as to the application of a restricted dietary in rheumatoid arthritis find confirmation within the limits indicated in the present series of 19 cases.

2. In cases rendered free, or nearly so, of acute symptoms by dietary means, exacerbations have been caused as an "experimentum crucis," by the ingestion of pure carbohydrate. Upon the withdrawal of this the symptoms have again subsided. The conclusion seems unavoidable that carbohydrate is a factor in the etiology and treatment of many cases of this disease.

3. Contemporaneously with natural or induced exacerbations of the disease there seems to be a tendency for the urine to

show a decreased acidity, as measured by the hydrogen ion concentration.

4. Observations on the carbon dioxide tension of the alveolar air in these cases show no great departure from the normal.

5. The non-protein nitrogen and urea of the circulating blood in uncomplicated cases of rheumatoid arthritis, examined both during ill health and convalescence, fall well within the normal range.

FEVER, THE INITIAL SIGN OF TUBERCULOUS INFECTION IN INFANTS.

REUBEN in the *Archives of Pediatrics* for March, 1916, says that everywhere one reads that tuberculosis of the mother is an absolute contraindication to nursing; this rule cannot be accepted *in toto*. Where nursing is of detriment to the mother it should never be advised, whether the mother is tuberculous or not. While Reuben does not underestimate the value of breast-feeding, he does not exaggerate the dangers of artificial feeding. It is not that he fears artificial feeding, but because he does not find it necessary under certain conditions for a tuberculous mother to wean her infant that he allows it in certain cases. Under these circumstances both the mother and the infant must be considered. If the mother has pulmonary tuberculosis, or tuberculosis of the breasts, the infant should be weaned at once. If the mother has latent, inactive tuberculosis and her physical condition is good he sees no reason for weaning. Tubercle bacilli are not excreted in the milk unless there is tuberculous involvement of the breasts; and as for the danger of infecting the infant, it is just as great if the infant be breast-fed or hand-fed by the mother.

Therefore, Reuben does not wean infants of tuberculous mothers under the conditions stated above, for if such infants become infected from their mothers (and in the majority of his cases he could trace the source of infection to some member of the immediate family), their chances of survival are far greater than they are when artificially fed. It would be ideal, if possible, in every case of a tuberculous mother to take her infant from her and bring it up under the most hygienic surroundings, away from the danger of tuberculous infection, certainly during the period in which tuberculous infection leads to tuberculous disease, and death in a majority of infants so infected. Reuben further concludes that:

1. The tuberculin reaction is a specific reaction. A positive reaction signifies the presence of a tuberculous focus, either active or latent, somewhere in the body. Normal individuals cannot be sensitized with tuberculin.

2. In infants tuberculous infection invariably leads to tuberculous disease, either mild or severe. The pathologic basis of tuberculous infection and tuberculous disease is the same in both—both terms imply the formation of tubercles. In the former the lesions are small, localized, and show signs of healing; in the latter the lesions are more extensive and more advanced. In adults tuberculous infection may take place without the occurrence of fever or any other signs; in infants tuberculous infection is invariably associated with fever and signs in the chest or abdomen.

3. All human beings are predisposed to tuberculous infection. Children of tuberculous parents are more apt to be tuberculous because they are more exposed to infection than are other children. Before they become infected, infants of tuberculous parents show the same physical development and the same gain in weight as do average children without tuberculous infection. The importance of segregating infants from tuberculous parents is apparent. Predisposition is easily overcome if exposure to source of infection is avoided.

4. Fever is the first sign of tuberculous infection in infants. The fever is of sudden onset; at first high (seven to fourteen days), is remittent, and gradually comes down by lysis, but not to normal; it continues at slightly above normal, 100°-101° for twelve to twenty weeks, with periods of complete absence of fever; exacerbations (two to three) of high fever, of same type as that of onset, usually occur.

5. The tuberculin reaction in these cases usually becomes positive at the onset of fever, or within a few days after the onset.

6. At the onset of the infection no physical signs are present. Within the course of a few weeks (two or three) they all develop signs in the chest, which, in cases which get well, gradually disappear.

7. The prognosis of tuberculous infection in infancy is more favorable than was formerly supposed; 30 to 35 per cent of these infants survive the infection.

8. From these facts Reuben is led to conclude that the pathologic lesions, even in infancy, may be localized and completely healed.

9. Fourteen per cent of prolonged febrile conditions in infants diagnosed as influenza give a positive Pirquet reaction. It is possible that many other fevers of obscure origin in infants, children, and adults are due to a reaction of the body to tuberculous infection.

10. The tuberculin reaction should be carried out on every infant who has an idiopathic fever and presents no physical signs.

FERMENTATIVE DIARRHEA IN INFANTS (CARBOHYDRATE FORM).

In the *Boston Medical and Surgical Journal* of April 6, 1916, HILL states that it is obvious that the one important principle in the treatment of a case of fermentative diarrhea due to carbohydrate is to give a food low in carbohydrate until the normal conditions are restored. If at the same time this food can contain a considerable amount of protein, in a form which is easily digestible, a great deal will have been gained, for in this way the reaction of the intestinal contents can be changed from acid to alkaline by the alkaline end-products of protein disintegration, and the source of the diarrhea removed. It is the high protein and relatively low carbohydrate percentage that has made the "Eiweiss" milk of Finkelstein and its various modifications valuable. The great drawback to these is their difficulty of preparation. The use of skim-milk dilutions, with the addition of powdered casein, meets the indication in treating fermental diarrhea, and such mixtures are infinitely more simple of preparation than any of the "Eiweiss" milk preparations.

During the past summer Hill has treated his cases of fermental diarrhea in this way. A soluble form of "calcium casein" was used, and found very satisfactory, the mixtures being very easy of preparation and the babies taking it very well. For babies under six months old a mixture of skim milk and water is used, with enough "calcium casein" added to bring the protein percentage up to 2.60 per cent—giving a formula: Fat, .25; sugar, 2.25; protein, 2.60. For babies over six months old the same dilution of casein is added to 3.00 per cent. One-third of an ounce of powdered casein in a mixture of 16 ounces of skim milk and water is used, but the powdered milk and 16 ounces of water raises the protein percentage to 2.60. In a 48-ounce mixture (24 ounces skim milk and 24 ounces water) 2/3 ounce of powdered casein raises the protein to 3.00 per cent. The amount given at each feeding depends of course on the individual baby, but in general slightly smaller amounts are given than would be given to a well baby of the same age and weight. The usual course of a case is that after a day or two of casein milk feeding the stools begin to diminish in number, become more yellow, and after three to five days become pasty, light yellowish-brown in color, and alkaline in reaction. After the diarrhea has stopped, whole milk is added to make the fat percentage from 1 to 2, and if this is borne well, in two or three days enough sugar is added to make the sugar percentage about 3.50. Malt sugar is the best to use, as it ferments less easily than do the other sugars. Sometimes the powdered casein is continued, sometimes not, depending on the case, but Hill has not fed any case on it for longer than 10 days. If the addition of the malt sugar causes no diarrhea, a gradual addition of sugar and a return to the normal feeding is made.

No drugs should be given to these cases. Drugs do the condition no good: it is simply a question of reëstablishing the acid-alkali balance of the intestine. Hill does not believe in an initial purge with castor oil: the irritating acids that have formed are quite enough of a cathartic, and it is adding insult to injury to irritate the intestine further. If there is a great deal of tenesmus and discomfort at defecation, and a great many stools, it is wise to give small doses of opium, but other than this no drugs are needed.

It would be tedious to give a number of case reports in detail, as most of the cases are very much the same, but a brief summary may be of interest. Thirty-five cases of fermental diarrhea were treated in the manner above described: all but two did well—one of these could not keep the high protein milk on the stomach; the other kept it down, but it did him no good. The remaining cases were most satisfactory. Most of the cases were babies under a year old, and it is surprising how they held their weight while being treated for diarrhea with the high protein milk; indeed, a good many actually gained. The average time of casein milk feeding was about five days; most cases began to improve in forty-eight hours.

On the whole Hill is convinced that when a high protein and a low carbohydrate milk is indicated, the best and simplest way of giving it is with skim milk and water dilution, made up to the required protein percentage by the addition of soluble "calcium casein."

TREATMENT OF PELLAGRA.

In the *New Orleans Medical and Surgical Journal* for March, 1916, Seccor points out that the obscure origin and cause of pellagra has necessarily made its treatment, to a great extent, symptomatic and empirical. In the *Journal of the American Medical Association* of May 8, 1915, an article appeared which reported the results that Dr. E. E. Palmer and the writer had obtained in the treatment of pellagra by autoserotherapy at the Kerrville Sanitarium. Since this report was made Seccor has treated a number of other cases, and always with the same excellent results.

They have recently received reports from various physicians who have used the autoserum treatment with success, not only in pellagra, but in other conditions where an increase in the antigenic function of the blood is desirable.

In their article in the *Journal of the American Medical Association* they did not make their technique as clear as they should have done. So they published in the *Medical Record* of July 17 a detailed description of their method, under the title of "An Improved and Simplified Technique for Autoserotherapy."

They mentioned in the above articles that tonic doses of arsenic hasten the improvement under autoserotherapy. Arsenic has marked action on the blood, producing a pronounced leucocytosis (Charteris, 1903). This condition of the blood serum produces a more potent exudate serum in the blister and gives more pronounced results.

In most of their cases they have found three drops of Fowler's solution after each meal amply sufficient. In a few cases, however, that did not respond readily to treatment, they have used ascending doses to ten drops after each meal.

They do not give arsenic continuously, but only for a few days at a time during the course of the treatment. In some cases with pronounced anemia they also use iron. For temporary relief of the burning in hands and feet, a strong solution of alum as a wash is quite effectual, and, for the sore mouth, liquor antisepticus as a cleansing agent is very pleasing.

In the cases with marked nervous and mental symptoms they use bromides for a few days until the serum treatment begins to show its effect, and in some cases it is necessary to continue their use at intervals for several weeks. It is on these nervous and mental symptoms, however, that the autoserum first shows its good effect.

In most of their cases 1 Cc. of the autoserum at intervals of one week proved perfectly satisfactory; in a few obstinate cases,

however, larger doses and shorter intervals were used with benefit in all but two cases, in which the symptoms were aggravated, and the dosage was immediately dropped to 1 Cc. While many of their first cases were cured by autoserotherapy without paying any attention to diet, they now make it a rule to see that patients get a well-balanced ration, free from canned goods.

It is possible that the very rapid results they have obtained in most of their cases have been partially due to change of climate, for nearly all of their cases were imported, coming from lower altitudes. The climate change, like arsenic, improves the blood, and this aids in the production of a more potent exudate serum.

They have had ample evidence that climate, diet, or arsenic taken alone will not produce cures in any considerable number of cases. Furthermore, they have seen patients, who were either at a standstill or on the retrograde after prolonged treatment by sodium cacodylate, picric acid, and diet, begin to improve promptly when placed on the autoserum treatment.

THE CHEMISTRY OF COW'S MILK AND OTHER PRODUCTS USED IN INFANT FEEDING.

In the *Archives of Pediatrics* for January, 1916, HOWE reminds us that in the nutrition of the infant we cannot get away from the fundamental facts that fats, carbohydrates, proteins and salts are the essential constituents, and any proprietary food laying claim to being a complete food for an infant must contain all of these in forms which can be readily assimilated and in properly balanced proportions. We all know how difficult it is to keep fats in a sweet and wholesome condition for any length of time, and while it is not difficult to keep the proteins, still it is no easy matter. This narrows the field very considerably when it comes to making a proprietary food, and as a natural result we find most of them are made of blended carbohydrates in a large measure, milk-sugar or maltose, dextrins, and the various starches, all of which can be used at less cost under their respective names and used as desired without the handicap of a blended product which is made to meet conditions in general and no one condition in particular. They have been admirably treated in Holt's book, and Howe includes Holt's analyses in this paper for the purpose of collecting all this data under one heading:

HOLT'S BOOK.

The Composition of Infant Foods.

	Nestle's Food.	Mellin's Food.	Malted Milk.	Ridge's Food.	Imperial Granum.	Lactoprep-arata.	Carnick's Soluble Food
Fat	5.48	0.31	2.66	1.11	1.04	12.35	7 54
Proteids	11.04	10.70	15.18	11.93	14.13	14.51	10.25
Dextrins	7.38	40.96	31.97	1.23	1.38		
Dextrose and maltose		37.38	31.79	0.52	0.42		
Cane sugar	30.59	4.23	4.15	1.16	trace		
Milk sugar	7.60					63.68	
Total soluble carbohydrates	45 57	82.57	67 91	2 91	1 80	63.68	27.08
Insoluble carbohyd. (starch)	29.95			77.96	76.11		37.45
Inorganic salts	1.72	3 20	3.34	0.49	0 39	3 66	4.42
Moisture	1.50	4.09	2.20	8.58	8.38	5.80	3 42

THE MANAGEMENT OF SUMMER DIARRHEA.

A. D. SMITH contributes to the *Archives of Pediatrics* for May, 1916, a long article on this topic. He states that the general principles of treatment are the same for all cases, and so distinct that there is no mistaking them. In applying them we are to remember that we are dealing with an intoxication arising from the intestinal contents, and that an inflammatory condition of the stomach or intestines may or may not be present. These principles are:

1. The thorough emptying of the stomach and intestines.
2. Rest in bed and rest to the stomach and intestines.
3. Supplying of fluid to compensate for the great drain.
4. Elimination of toxins.
5. Measures to allay the inflammation.

To these general principles must be added:

6. The treatment of special symptoms.

The Thorough Emptying of the Stomach and Intestines.—Vomiting sometimes empties the stomach completely. If any doubt exists the stomach should be washed out. Persistent vomiting is usually controlled by

washing with the fluid at 110°. In the severe cases of cholera infantum the stomach is always to be washed out. When the fever is high 1 or 2 ounces of water may be left in the stomach. Lime-water may be introduced with benefit if the stomach contents are very sour. In children over two years of age stomach washing cannot be employed without undue struggling, the very thing we wish to avoid. As a substitute for stomach washing, boiled warm water may be given freely. It is usually vomited promptly and may cleanse the stomach.

For emptying the small intestine cathartics alone are available. Calomel will usually suffice in the mild cases. It is a mild intestinal antiseptic and increases the flow of bile. Up to one year 1/10 grain is given every half-hour for ten doses; between two and three years ⅛ grain every half-hour for ten doses; from three to six years 1/6 grain every half-hour for ten doses.

Castor oil should follow the calomel in all severe cases. It can be given one-half hour after last dose of calomel. Up to one year, 1 drachm; one to three years, 2 drachms; three to six years, ½ ounce. It is frequently vomited, but is so adhesive that it usually will not all be vomited. It should be repeated three times if vomited. It sweeps the whole intestinal canal, is very certain, and its after-effects are soothing.

Saline cathartics are useful if the movements are small in amount and we desire to aid in elimination. They should not be used when the patient is greatly depressed, with sunken fontanelle, low temperature, and evidences of great need of water. Milk of magnesia is prompt and antacid, but is mild and not to be relied on in serious conditions. Sodium sulphate is better borne by the stomach than any of the other salines except milk of magnesia. It is best given in repeated small doses—10 grains in 1 drachm of water to a child of one year.

Colon irrigation should be used in all severe cases to supplement the action of cathartics. It should be done by the physician himself or by a competent nurse two or three times during the first day. Afterward once daily is usually enough. The best solution is normal saline, one tablespoonful of salt to two quarts of water. The bag of the fountain syringe is held about two feet above the child. After expelling the air and filling the catheter, No. 15 American scale, with saline, the catheter is inserted just within the sphincter and the water turned on. As it flows the catheter is gradually pushed upward to a distance of ten or twelve inches. The water distending the intestine in advance of the catheter makes its introduction easy, and prevents the catheter curling on itself in the majority of cases. The washing should be continued until the solution returns quite clear. Gentle kneading of the abdomen should be continued during the early part of the irrigation to facilitate the passage of the water into the upper part of the colon. When the temperature is low, with symptoms of collapse, the normal salt saline should be at a temperature of 110°. If the temperature is high, it can be reduced by using the solution at a temperature of 80° F.

Rest in Bed and Rest to the Stomach and Intestines.—Rest to the stomach and intestines is a *sine qua non* of the treatment. Emphasis should be placed on keeping these patients quiet in bed. Even if the child is able to walk it should not be allowed to do so.

Rest for the stomach and intestines is accomplished by withdrawing all food for from eight to twenty-four hours. The withdrawal of food should be complete. In all severe cases digestion is practically at a standstill, and food given at this time will only increase the difficulties of the position. Boiled water is to be given cool and in small amounts at frequent intervals.

Supplying of Fluid to Compensate for the Great Drain.—In the mild cases this can be accomplished by giving cool boiled water frequently. In the more severe cases the colon will absorb a considerable quantity of fluid if, after the intitial thorough cleansing, the irrigation with normal saline is continued, allowing the water to

flow in and return slowly, and using as much as 1 or 2 gallons. In the severe cases and those of the cholera infantum type, the only efficient method of supplying the great amount of fluid lost is by hypodermoclysis. At least half a pint should be given in the course of twelve hours, and sometimes more is better. The injection is given into the cellular tissue of the abdomen or buttocks slowly.

Elimination of the Toxins.—Elimination is assisted by the fluids supplied. The colon irrigations assist in the elimination from the bowels, the kidneys, and the skin. Occasionally salines are useful to assist elimination from the bowels. Bathing is useful to assist elimination from the skin.

Measures to Allay the Inflammation.—Rest to the stomach and intestines is important. After the digestive tract has been thoroughly cleaned out and the toxemia lessened, the inflamed intestinal mucous membrane should be covered with bismuth. To accomplish this bismuth subnitrate must be given in large doses, at least 1 or 2 drachms to a child of one year. It is insoluble in water, and is best given suspended in mucilage of acacia. It usually blackens the stools.

Intestinal antiseptics are useful even if they do not render the whole intestinal tract antiseptic. Certainly it is reasonable to believe that they inhibit bacterial growth, and experience leaves no doubt that they are beneficial. Salol is the best, as it leaves the stomach unchanged, and is decomposed in the intestines into carbolic and salicylic acids. It has the disadvantage of causing vomiting sometimes. It should be given in doses of 1 or 2 grains every two hours to a child of two years. Bismuth is also antiseptic, though this action is secondary to its protective influence on the mucous membrane.

Astringents are indicated only in catarrhal diarrhea which follows the acute symptoms. Tannalbin is the most useful. It is insoluble in the stomach, but is slowly decomposed in the intestines. It therefore causes no gastric disturbances, but is gently, yet firmly, astringent on the entire intestinal mucous membrane. Patients under one year are given 15 to 30 grains in the twenty-four hours. Sometimes it can be used with opium. It is insoluble in water, and should therefore be given in gruel or suspended in mucilage.

Opium is used much too frequently and often at the wrong time. Its indications are a continuance of the frequent movements and severe pain. It is contraindicated until the stomach and intestines have been thoroughly cleaned out, when the number of discharges is small, and especially if they are offensive, and when cerebral symptoms with high temperature are present with scanty discharges. It finds its best use during convalescence, when the taking of food is followed by a movement of the bowels. To a child of one year 5 minims of paregoric may be given, always in a separate prescription, to be repeated until the desired effect is obtained. In cases of the cholera infantum type, with large fluid movements and symptoms of collapse, morphine should be given hypodermically, 1/100 grain to a child one year of age, remembering always the contraindications.

The Treatment of Special Symptoms.—Acid fermentation in the stomach, manifested by vomiting of sour material and eructation of gas, is best met by the alkalies, lime-water, bicarbonate of soda, or chalk mixture. Either of the first two may be added to the water and used for washing out the stomach when indicated.

Prostration is present in the majority of cases. It is best relieved by whisky, diluted with at least eight parts of water. It can frequently be added to the water given to allay the thirst. Half an ounce of whisky to a child one year old is the maximum amount as a rule. If needed, tincture of strophanthus, 1 or 2 minims every four hours, may be added to the whisky. [We question the value of strophanthus.—Ed.] If stimulants given by the mouth are vomited and the case is a severe one, they are to be given hypodermically. Whisky, ether, and camphor in oil (1-in-10 solution) may be used. Strychnine is not to be used when

the nervous symptoms are those of irritability with a tendency to convulsions. The dose is 1/300 grain to a child one year old. In cases of the cholera infantum type morphine 1/100 grain with atropine 1/1200 grain hypodermically, is sometimes life-saving. In connection with these cases hypodermoclysis finds its most certain indication.

OBSERVATIONS ON 100 CASES OF THE INFANTILE TYPE OF HEREDITARY SYPHILIS.

In the *American Journal of Diseases of Children* for March, 1916, VEEDER and JEANS state that they have attempted to carry out various methods of treatment and combinations of drugs in a comparative way, being governed to a large extent in methods by the case as an individual problem. In some cases in their series the duration of the treatment was too short to be of any value in forming an opinion as to the efficacy of the method, and in 11 cases no treatment was instituted for various reasons. They have been able, however, to accumulate sufficient data in 73 cases, in 41 of which neosalvarsan was used in combination with mercury, and in 31 some form, or forms, of mercury alone was given. As experience has shown that neosalvarsan alone is not as efficacious as when combined with mercury, but one infant was treated in this way. They do not use iodides in the treatment of hereditary lues. In the light of the specific action of mercury and arsenic on the comparatively recently-discovered etiologic spirochete of syphilis, it is hardly a rational procedure, and, moreover, it is a drug not easily borne by the infant. The various combinations and the number of cases in which each was used are shown in the following table:

Form of Treatment and Number of Cases.		
Neosalvarsan 1		
Neosalvarsan with gray powder.....21		42
Neosalvarsan with inunction..... 8		
Neosalvarsan, gray powder and inunction.12		
Inunctions 13		
Inunctions and gray powder 7		31
Gray powder 11		

The neosalvarsan injections were all given intravenously by means of a glass syringe into the median or external jugular vein, as a rule. The dosage used was 0.075 to 0.15 gm., according to the size of the infant. No bad results were experienced following the injections. The 42 infants receiving neosalvarsan were injected as follows:

21 cases received 1 injection.
12 cases received 2 injections.
7 cases received 3 injections.
2 cases received 4 injections.

The deaths were divided proportionately between the cases receiving mercury alone and mercury in combination with salvarsan. For the reasons discussed, the mortality is of little service as an index of the value of specific treatment in these cases, and they can only form an opinion by considering the effects of treatment of the symptoms.

Neosalvarsan causes a rapid disappearance of the syphilitic lesions, especially of the cutaneous symptoms and the rhinitis. It is more rapid in its effect than inunctions of mercury, and much more so than gray powder used alone. Intramuscular injections of mercury are not suitable for use in infants or in children. It is a simple procedure to inject neosalvarsan intravenously, and they use it freely in the out-patient dispensary without admitting cases to the hospital. The only precaution to be taken is that it must be injected directly into the vein without any of the solution escaping into the perivascular tissues. This requires some degree of skill and practice for small veins, and hence the external jugular is easier for routine work.

In a number of cases the use of neosalvarsan has caused such a rapid disappearance of the rash and rhinitis that it has been difficult to persuade the parents that the condition was not trivial and that the child required further treatment. The hardest problem as regards the medicinal treatment of hereditary syphilis consists in persuading the parents to persevere in treatment after the active signs of the infection have disappeared. On the other hand, inunctions are unpleasant and very much objected to by the infant's caretaker as a rule. Nevertheless the treatment should be

started by one of these two intensive methods of combating the infection. They find it most satisfactory soon to discontinue the one used and change to gray powder, which is the most useful form of mercury they have found for treatment over long periods of time, as it causes as a rule the least disturbance of digestion. If started early, before all active signs have disappeared under the more intensive inunctions or salvarsan therapy, it is more apt to be continued for a longer period of time. The ideal method for practical purposes, and the method which gives best results, in their experience, is two injections of neosalvarsan with a three-day interval followed by a series of courses of gray powder (gr. 1.5 t. i. d.) of a month or six weeks' duration, with an interval of from ten days to two weeks between courses. These should be continued well into the second year of life, or until the Wassermann has been made persistently negative, if the case can be kept under control for such a length of time. If neosalvarsan is not available, a course of inunctions of mercury (gr. 10 to 15 daily), lasting two weeks, may be substituted.

It is at times surprising to find how the Wassermann persists after seemingly intensive treatment in many cases. They are trying to ascertain how many of these infantile cases in which the extent of the treatment is known develop "late" lesions in childhood, as they know of no studies in regard to this point, but the nature of the material at their disposal makes such a study difficult. A careful control of the diet and of the general hygiene is as essential as the specific therapy as far as the immediate treatment of the case is concerned.

In a previous paper they made the statement that they had been unable to obtain a persistently negative Wassermann in a child with "late" hereditary syphilis, despite the most intensive treatment. Although some of the cases reported at that time have been under treatment for a year and a half since, they have no cases as yet which lead them to modify this statement. This, however, does not hold true for the infantile type, as in a number of the cases in this series the Wassermann has become negative as the result of the treatment outlined above and has remained so for many months, nor have these cases developed any further symptoms of lesions of a syphilitic nature. In other words, it seems probable that some cases have been cured, if, as is held at present, a persistently negative Wassermann constitutes a proof of cure. In the majority of cases, however, it would seem as if the condition had only become latent or quiescent as the result of treatment, and only the subsequent course of the case can determine whether this treatment—which has caused the disappearance of all clinical manifestations, but which has not affected the Wassermann—has been sufficient. From their knowledge of the early treatment of many children with late lesions they are not very optimistic in regard to this group of infants. Cases of apparent clinical similarity respond differently to the same kind and amount of treatment. In some of their cases the Wassermann has become negative, while in others treated in the same way it has remained positive. No general rules, therefore, can be deduced from their cases in regard to the length of time treatment is necessary for the production of a negative Wassermann. Each case in this respect must be treated individually, and they can only say that if the development of late lesions is to be inhibited, it is apparently necessary to continue the treatment of an infant with syphilis until the Wassermann has become negative and remained so after an interval of freedom from specific medication.

AMMONIA AS AN ENEMA.

In the *Lancet* of February 12, 1916, BLACK writes as follows:

"May I draw your readers' attention to the effectiveness of an ammonia enema in the treatment of postoperative ileus and intestinal paresis? This sequela of an abdominal operation all have found to be most distressing to the patient, while it is exasperating to the surgeon, and in extreme cases even dangerous to the patient's life.

I understand that at the front it has proved frequently a fatal complication of operations for abdominal wounds.

"The prescription is liq. ammon. fort. 1 dr., water one pint, administered as an enema; its effect is greatly enhanced by a hypodermic of pituitary extract 1 Cc. half an hour previously. This treatment is sure to result in a good motion and discharge of excessive flatus, and again and again I have found it to act where the ordinary enemata, turpentine, eserine, etc., had failed. Two words of warning I would give—namely, that if used frequently, or if used in greater strength than I suggest, injury to the rectal mucous membrane is liable to take place. On two occasions the daily administration of the enema for three consecutive days resulted in a certain amount of rectal hemorrhage. On another occasion the mistake of a nurse in putting in too much ammonia gave the patient a very painful septic colitis lasting for a week.

"My excuse in writing about this is that although I do not claim originality, I have not been able to find in any text-book any mention of ammonia used as an enema, nor have I ever met any one in England who ever heard of it. Yet I am convinced of its importance."

PITUITRIN: ITS USES AND LIMITATIONS IN OBSTETRICAL PRACTICE.

JONES in the *Virginia Medical Semi-Monthly* of February 25, 1916, states that he used his first dose of the preparation a little over eighteen months ago. Since that time he has had 58 obstetrical cases and used pituitrin in 14 of them—four primiparæ and ten multiparæ. He has tried to be very careful in the selection of his cases. He has never used it before dilatation was almost if not quite complete, until he assured himself that the position was such as not to materially interfere with delivery; until he felt reasonably sure there was no special abnormal resistance in the soft parts or in the bony pelvis; nor has he ever used it until the pains had become inefficient and the progress of labor markedly retarded or entirely arrested. He has never given more than one Cc., nor has he ever repeated the dose.

In two of the primiparæ the result was good, though not nearly so pronounced as in some others. The pains were stimulated very much almost immediately, and one case was delivered in about 35 minutes, and the other in about 45 minutes, after giving the pituitrin. In the other two cases he was much disappointed. In one there was just one strong pain in from three to five minutes after giving the medicine, and then all pain ceased and he delivered a little later with forceps. In the other, pains were temporarily stimulated but soon grew weaker, and he resorted to instruments again.

But what of the ten multiparæ? Some doubt may be cast upon the statement, but Jones gives his word that in each case in less than twenty minutes—and sometimes much less—a crying baby was born. The pains came on almost immediately—certainly in not over three to five minutes—and kept up good and strong as long as pains were needed. One objection, as he sees it, is that at times they come with almost no interval between them. Now, considering the fact that in every case there was marked uterine inertia with no prospect of an early termination of labor, he regards the effects as very remarkable. He has given chloroform in perhaps one-third of the cases after giving pituitrin, but, strange as it may appear, the patient seems to be so taken up with the changed condition of affairs and the progress of labor that she rarely says much or complains of the pains being unbearable. By way of illustration, he gives something of the experience with his first patient of the kind, a multipara. After waiting a good long time on a tedious labor and a tired patient, with many misgivings and forebodings he decided to give pituitrin. The result was, of course, as above mentioned. Early in the calm that followed the awful storm the patient innocently said, "For the Lord's sake, doctor, what-fur stuff was that you put in my arm?" He gave an evasive

answer and asked why she wanted to know. She said, "Well, I don't know much about it, but it 'peared to me it must a bin dynimite." So, when we use pituitrin in this class of cases we had better have things in readiness for an immediate reception. We as children used to say, when the nose itched, "somebody's coming." The itching nose sometimes failed to bring the visitor; but pituitrin, never!

It may naturally be asked if all these cases would have been instrumental ones, and if they could not have been delivered just as readily with forceps as by the use of pituitrin. Some of them, he is quite sure—and he thinks at least one-half of them—would have been delivered with forceps, and with proper help this could have been done quite easily. To be sure, some city practitioners may prefer this line of procedure, but when we "country devils," to use Dr. Fisher's designation, have to act as operator, assistant, anesthetizer, nurse, and "granny," Jones prefers pituitrin. And, besides, with pituitrin one can get through before one can get his forceps boiled.

In none of the 14 cases was there a laceration of the perineum, or a postpartum hemorrhage. In one case, however, he encountered extreme difficulty in delivering the placenta. Whether or not the pituitrin was in any way responsible for this trouble he does not know, but he is inclined to think it was. He has used pituitrin in one case of postpartum hemorrhage (though it had not been used during labor) with very prompt and satisfactory results—more prompt and pronounced than he has ever gotten from ergot or ergotole. Why the effect is so much less satisfactory with primiparæ he does not know, but in his experience such has certainly been the case.

Jones thinks he has indicated, in a general way, what he would consider some of the most important contraindications. He finds it is often used in the first stage of labor, but from what he knows of its action he would not expect very satisfactory results until dilatation is well under way. What pituitrin does, it does so quickly and with such tremendous force he would feel that there was too much resistance to be overcome when used early, and his experience has been that better and stronger pains are produced when used later. He has never used it in abortion or premature labor, but does not see why it should not do well when the pains lack force. It seems to him that its field of usefulness in obstetrical work is rather a restricted but at the same time a very important one. When indicated, he is quite sure we have nothing in the way of an oxytocic that can be compared with it. The fact is, in properly selected cases he gives it with as much confidence as he gives a hypodermic of morphine for the relief of pain in renal or hepatic colic.

SERUM TREATMENT OF BACILLARY DYSENTERY.

The *British Medical Journal* of January 22, 1916, in an editorial article points out that as long ago as 1907 Kruse and Shiga independently proposed the use of serum made from the bacilli known by their names for the treatment of dysentery, and good results were said to have been obtained. In later years, however, so many other species of bacilli have been found to produce symptoms of bacillary dysentery that it has become necessary, in the absence of definite bacteriological research, to use serums called polyvalent made from several varieties of such germs. In 1910 Ruffer and Willmore prepared such a polyvalent serum, the constituents being the following bacilli: (1) Shiga-Kruse No. 1; (2) El Tor No. 1; (3) pseudo D. (Kruse); (4) Flexner, including pseudo A. (Kruse); and (5) some as yet unidentified strains. At the same time a monovalent serum against the Bacillus dysenteriæ El Tor No. 1 was made also. In using these serums for treatment the general practice of the authors was to give an initial dose of 40 to 60 Cc. in mild cases, of 80 Cc. in severe cases, and of 100 to 120 Cc. in desperate cases. These doses were repeated as required, as much as 320 Cc. being given in twenty-four hours.

The injections appeared to have a bene-

ficial effect, manifested in from four to twelve hours after the first injection. In all cases the most striking phenomenon was the improvement in the patient's general condition; the pulse became fuller and slower, the heart sounds of better quality, the temperature fell to within normal limits, and abdominal pain disappeared. A remarkable effect upon the patient's mental condition was observed also. These striking changes in the general condition were not usually accompanied by a corresponding improvement in the character of the stools, which often became more abundant and fetid and contained more sloughs; the number passed, however, was usually diminished.

In 1913 Willmore and Savage gave a short account of the treatment of 227 cases in which the presence of bacillary infection was demonstrated. In this series it was often noted that the patient exhibited marked improvement for a few hours following the injections, only to relapse again when presumably the effects had worn off. In such cases the injections had to be repeated until the improvement became permanent. Between November, 1912, and January, 1913, the number of pilgrims that passed through the quarantine station at El Tor was 16,551. Of these 75 were admitted into hospital with dysentery and nine died. Out of 26 cases in which bacillary dysentery was present, 22 were treated with serums, with two deaths, a mortality of 9 per cent. The percentage of deaths among pilgrims in Egypt attacked by dysentery has been reduced since the introduction of serums from 53, and even from 70, to 12.

Similar satisfactory results have apparently been obtained in Japan and Fiji, as well as in France, Russia, and Germany. The notes on the treatment of diarrhea and dysentery issued by the Advisory Committee for the Prevention of Epidemic Diseases in the Mediterranean Force say of the serum available for the force that there is no doubt that in many cases it is of great value, and that the earlier it is given the better; a dose of 20 Cc. administered by subcutaneous injection is, as a rule, sufficient, but, if deemed necessary, as much as 60 Cc. may be given at the outset, or the smaller initial dose may be repeated. Shiga is responsible for the statement that since the introduction of antidysenteric serum the case mortality from bacillary dysentery has fallen from 35 to 9 per cent. Many serums are now to be obtained, including those of Kruse, of Shiga, of the Lister Institute (Todd), and of the Pasteur Institute (Vaillart and Dopter). Shiga's rules for the administration of his polyvalent serum are: In mild cases to inject one dose of 10 Cc.; in cases of medium severity to inject two doses of 10 Cc. at intervals of six hours; in severe cases to inject 10 Cc. twice a day, at intervals of six hours, for two or three consecutive days. Castellani and Chalmers state that a polyvalent serum, such as that of Shiga, is to be preferred for the treatment of cases in which a complete etiological diagnosis of the malady cannot be made. The serum, in their experience, should be given in large doses—that from the Pasteur and Lister Institutes in 20 Cc. doses twice daily, and in very severe cases four times daily. The injection can be made intravenously or under the skin of the abdomen or flank, using ordinary aseptic precautions. Such injections, they believe, as a rule need not be continued after the second or third day. In some instances the injections cause a slight rise of temperature or even urticaria-like eruptions and pains in the joints. According to their experience the serum has a marked effect upon the disease, hastening the cure, ameliorating the symptoms, and reducing the mortality.

Other observers have not perhaps met with such good results, and it is a fact that there are cases in which the serum appears to fail. The cause of these failures may quite well be that the individual case of the disease is due to some species or strain of bacillus not contained in the serum that has been used. This is a possibility which must not be lost sight of.

Again, it is quite possible that in the past amebic cases may have been so treated, as

well as cases of diarrhea and bowel troubles not necessarily connected with dysentery, and the Mediterranean "notes" from which we have already quoted say that "in cases of doubtful etiology there should be no hesitation in employing a combined therapy of emetine and polyvalent serum." The diagnosis of the various forms of dysentery is not easy, and until this has been put on a more scientific basis much confusion must necessarily exist as to the treatment most suitable for each individual type. On the whole, however, the bulk of the evidence is in favor of the use of serums in bacillary dysentery. It is important that records should be carefully kept of all cases so treated, as the statistics so obtained will be of the greatest use in the future.

SALVARSAN INTRAVENOUSLY AND WITH AUTOSALVARSANIZED SERUM INTRASPINOUSLY IN TREATMENT OF SYPHILIS OF THE CENTRAL NERVOUS SYSTEM.

DEXTER in writing in the *Cleveland Medical Journal* for January, 1916, reaches these conclusions:

1. There are undoubtedly cases in which an arrest of the process may be accomplished by the use of mercury alone. On the other hand, there are a very definite number of cases of syphilis of the central nervous system in which the action of mercury is positively detrimental. In these cases salvarsan acts extremely well and is an invaluable addition to our armamentarium.

2. There are many instances in which the process may be arrested by the intravenous injection of salvarsan alone. These are usually meningovascular involvements, and the best results are to be expected in the early cases, especially those which have begun to have symptoms, but in which the physical signs of the disease are either absent or slight. Whether the abolition of all the serological signs of the disease can be expected under the intravenous administration of salvarsan is, as far as Dexter's experience goes, still open to doubt.

3. When mercury given intramuscularly and the intravenous injections of salvarsan have failed to arrest the process satisfactorily, the intraspinal administration of autosalvarsanized serum will have a markedly beneficial effect in a large proportion of cases.

4. The form of affection most amenable to treatment is that with meningovascular involvement. The greater the central degeneration the less can be expected from treatment, for there is no drug which can reëstablish nerve tissue once it has been destroyed. As it is often difficult to differentiate clinically between these types of the infection, active and intensive treatment should be tried in most cases. However, it is probable that very little can be done in most cases of general paresis.

5. The Swift-Ellis method for the intraspinal administration of autosalvarsanized serum, when carefully administered and rigidly adhered to, is a safe and eminently proper procedure for the combating of syphilis of the central nervous system.

THE ROLE OF FAT IN INFANT FEEDING.

MORSE in the *Archives of Pediatrics* for January, 1916, states that little is known as to the significance of fatty acids and soaps. Fatty acids are irritating to the intestines, soaps are not. A loose, acid stool can often be changed to a "soap stool" by a relative increase in the amount of casein in the food, while an alkaline soap stool can be changed to an acid stool by a relative increase in the amount of carbohydrates. That is to say, whether the fat is in the form of fatty acids or soap depends chiefly on the reaction of the stool, which in turn depends on the relation of the food components to each other. The intestinal flora also changes with the change in the reaction. The absorption of fat in babies that are passing soap stools is less than when the stools are normal. (This raises the question as to why so many pediatricians are so anxious to get "soap stools.")

Increased peristalsis with consequent

diarrhea results in an increased loss of fat in the stools. It makes no difference what is the cause of the diarrhea, whether it be an excess of fatty acids, an excess of carbohydrates, or some parenteral infection.

The relation between the amount of fat in the food and the absorption of such salts as combine with fat would seem at first glance to be a very simple one. Such is not, however, the case. It seems probable that when there is a large amount of soap the absorption of calcium and magnesium is diminished. It would seem reasonable *a priori,* moreover, to suppose that when the fat in the food is increased beyond a certain point, there would be an increasing loss of mineral salts. This is apparently not the case, however, unless there is a fat diarrhea, because the data from metabolism experiments show that in the normal infant a high fat intake does not change the mineral composition of the stools. In chronic malnutrition, however, the output of salts in the feces is considerably raised by increasing the fat in the food.

NEEDLESS SURGICAL OPERATIONS FROM FAILURE TO RECOGNIZE TABES DORSALIS.

The *Journal of the American Medical Association* of February 12, 1916, contains an article in which NUZUM reaches these conclusions:

1. Of 1000 tabetics, 8.7 per cent have been subjected to laparotomy under mistaken diagnosis one or more times.

2. The "crises" of tabes have largely influenced the surgeon in his decision to operate. This statement is supported by the fact that 65 per cent of the eighty-seven patients operated on presented visceral crises. In 17 per cent of these the "crises" were the initial symptoms of their disease.

3. Mistaken diagnoses and resulting operations occur chiefly through failure to examine the nervous system.

4. Gastric ulcer, gall-bladder disease, and appendicitis are the diagnoses most frequently made.

5. Tabetics subjected to several successive laparotomies have, as a rule, been operated on by as many different surgeons.

6. A history of paroxysmal attacks of vomiting, rheumatism, paresthesias, bladder disturbances, or fractures without physical violence should excite interest to exclude tabes dorsalis.

7. The cytodiagnosis of the cerebrospinal fluid, together with the Wassermann reaction with the spinal fluid, is of inestimable value in doubtful cases.

THE ROLE OF SALT IN INFANT FEEDING.

In the *Archives of Pediatrics* for January, 1916, BARTLETT points out that the individual salts of cow's milk are present in larger quantities than the corresponding salts of woman's milk with the exception of iron—1000 grammes of woman's milk contains from 1 to 4 mg. of the oxide of iron; 1000 grammes of cow's milk contains 0.4 to 0.7 mg. After cow's milk is diluted the iron content in the resulting dilution is reduced to a negligible quantity. It is necessary for the child's nutrition to make up this iron deficit when the child is fed on cow's milk. The anemia which often accompanies prolonged milk feeding is familiar to every one. At least one explanation of this is found in the lower iron content of milk formulæ. It is desirable to make up this loss in iron. There are two ways to accomplish this: by administering iron directly or supplying the iron by adding to the diet articles of food containing iron. The latter is the more rational way to meet this contingency. Before the more accurate methods of infant feeding became established, food from the table was fed to infants. This practice has not been entirely abandoned. Perhaps there is some practical wisdom in this careless mode of infant feeding which scientific methods have failed to recognize.

It is Bartlett's belief that the nutrition of many children has suffered from the failure to supply early enough an adequate quantity of iron, as well as other salts, to the growing infant. The age at which this

deficit in iron manifests itself is after the sixth or seventh month. This period corresponds with the eruption of the teeth. After six or seven months the loss in iron may be made up by giving other foods besides milk. If these foods are given in small quantities at first, and gradually increased, the adaptation to the articles of diet may be accomplished without harm to the infant. Some of the foods which may supply the iron, as well as other salts, are yolk of egg, cereals, green vegetables, and cooked fruit. Properly cooked and properly fed, Bartlett believes these foods may be given without damage to the digestion.

Bery has shown that green vegetables furnish calcium in one of the best forms for absorption, and that if properly administered they serve a valuable function in the mineral nutrition of the child. This is especially true of spinach. Besides furnishing iron to the growing organism, the feeding of green vegetables also especially favors calcium retention. It has been Bartlett's practice for some time to feed eggs and green vegetables to healthy children under a year, and he believes that it has resulted in producing more vigorous infants. Their fontanels have closed earlier, they have walked earlier, and they have been more active. In a word, they have seemed to be stronger, healthier infants than those who have been fed milk almost exclusively during the first year. He believes that this improvement in nutrition is in part due to the increased salt retention, especially as it is related to iron and calcium.

VENESECTION AS A THERAPEUTIC MEASURE.

In the *Boston Medical and Surgical Journal* of February 24, 1916, LAWRENCE after discussing this subject says, in conclusion, that the following statements seem justified by the cases he reports and others:

1. Venesection, performed under proper indications, is not a dangerous measure, especially since the "dose" can be accurately controlled.

2. In the presence of dilatation of the heart, renal toxemia, hypertension, or a combination of these conditions, it may be expected to act more promptly and more surely than drugs.

3. It lowers blood-pressure and at the same time produces a more efficient circulation when performed in cases of hypertension, but does not, in therapeutic "doses," lower normal arterial tension.

4. It should never be performed in the absence of definite indications, but should not be withheld until the hope of success for any measure is gone.

5. The amount of blood to be withdrawn is to be decided by the point at which relief is obtained. The error is generally on the side of too small an amount.

6. Repeated bloodletting, when indicated, does not seem to have any ill effects upon the composition of the blood.

THERAPEUTIC APPLICATIONS FOR THE LOCAL TREATMENT OF DISEASES OF THE EAR, NOSE AND THROAT.

In the *Indianapolis Medical Journal* of February 15, 1916, COBLE in speaking of the various remedies he has found useful proceeds to name these drugs and some of their mixtures. To one doing special work in this line many additions would have to be made to complete a satisfactory list; in fact, one would nearly have to compile his own list, in order to bring it up to his own views and requirements.

Cocaine hydrochloride is a most useful and valuable drug, but one that must be used with great caution. Many patients object to its use, but no satisfactory substitute will take its place.

The nasal mucosa is very sensitive and the introduction of probes or applicators within the cavity is painful and usually produces sneezing without its use. In order to allay this condition and also to reduce the swelling of the tissues which frequently hide from view the deeper structures of the nasal cavity, it is advisable to produce at least a partial cocainization. This may be accomplished in two ways: (1) by spraying into the nostrils a small amount of either a

2- or 4-per-cent aqueous solution of cocaine; (2) by the application of cotton pledgets to the mucous membrane moistened with the above solution; or, if a full dilatation is desired, add to the drachm 2 to 10 m. of 1:1000 adrenalin chloride solution.

In some individuals a full dilatation will be followed by a marked reaction, sneezing, stuffiness of nostrils, and a profuse serous discharge; usually much more marked where adrenalin chloride has been used. It is a wise plan to at least mention the possibility of some reaction occurring to the individual upon whom it is used the first time.

The shrinking of the turgid membranes of the nose in acute rhinitis with cocaine or cocaine and adrenalin, followed by drainage of pent-up secretions particularly from the anterior ethmoid cells, produces a certain amount of relief in no other way obtainable. After dilatation, if the nasal cavities are full of thick mucus, they may be cleansed by the normal salt douche; care being taken that the salt solution does not flow too rapidly, and that the patient breathes through the mouth and the return flow is unobstructed.

Cocaine hydrochloride in solution from 2 per cent on up to the so-called cocaine paste (composed of flaky crystals of cocaine and adrenalin chloride solution) is used extensively to produce anesthesia to mucous membranes. However, its use hypodermically has been very much lessened since the advent of novocaine, alypin, quinine and urea, etc.

Silver nitrate in a 2-per-cent aqueous solution is useful where a mild yet positive astringent action is desired in subacute nasopharyngitis. Slight pain and a peculiar burning sensation follows its use in the nasopharynx. In gaggy individuals the palate should be cocainized, and the cotton swab moistened with the 2-per-cent silver nitrate solution, and must be simply damp and not dripping.

In acute inflammations of the faucial mucous membranes and tonsils much higher per cent solutions are advisable—10, 15, 20, and 25; the last two are very useful in acute follicular tonsillitis; in some instances one application will abort an attack if applied in the primary stage.

Silver maxims: (*a*) The milder the inflammation the milder the solution. (*b*) The more intense the inflammation the stronger the solution. (Ballenger.)

Strong solutions of silver nitrate applied in subacute inflammations will probably irritate the existing condition; they coagulate the mucous secretions and blanch the mucous membranes, thereby producing a chemical trauma.

Whenever a solution of silver nitrate is used in the throat, care should be taken that none enters the larynx or a laryngeal spasm will result. The smallest amount will produce such a reaction as will not be easily forgotten.

Guaiacol should be used in 10-, 25- and 50-per-cent solutions in pure olive oil, in acute faucial and tonsil inflammations. The stronger solutions give best results in severe inflammations. Guaiacol may be applied pure in intense infections, usually with good results; yet it is not considered as efficient as the stronger solutions of silver nitrate.

Argyrol, a compound of a derived proteid and silver oxide, containing from 20 to 25 per cent of silver nitrate, is used when the silver nitrate solutions are too irritating. It may be used in 15- or 20-per-cent aqueous solutions in atomizers. It causes no irritation when used in the nasopharynx, and may be sprayed into the larynx without causing any spasm. A hard-rubber tube should extend into the solution in place of metal, as the latter will corrode; also remove residual amount of argyrol solution from any metal portion to avoid decomposition and consequent stoppage.

Small crystals may be inserted to the bottom of infected crypts of the tonsils, there allowed to dissolve, giving continuous application for considerable time.

In 15- to 25-per-cent aqueous solutions (warmed) a few minims may be dropped into an ear (after cleansing) that requires some mild antiseptic. However, it seldom is of value in a chronic discharging ear.

Acute inflammatory conditions of the larynx are greatly soothed by the inhalation of steam from a solution of hot water, one pint, compound tincture benzoin, one drachm; this may be used in a special inhaler for that purpose which is placed over the fire, or one can make a cornucopia out of cardboard, so the vessel containing the solution may set on the stove and the user will not be bothered by the heat.

In chronic granular pharyngitis, especially when the condition is somewhat irritated, compound tincture of benzoin may be applied full strength with good effect.

Gauze moistened with compound tincture of benzoin used for packing the nose will remain free from foul odor for a much longer period than plain packing.

Tincture of iodine, drachm j,
Glycerin, q. s. ad ounce j,

has long been used as a nasopharyngeal application. When stronger solutions of iodine are desired the following formula is to be recommended:

Iodine crystals, grs. ijss-x;
Potassium iodide, grs. vijss-xxx;
Glycerin, ounce j.

The stronger solution should never be used first; it is much better to start with the weaker and, if necessary, gradually increase the proportion of iodine, so there is some stinging when applied. After tonsillectomy in adults the iodine solutions may be used to promote healing; these are especially applicable where silver nitrate solutions cause pain in the wound and a reflex pain in the ears.

The weaker solutions of iodine in glycerin may be applied as a medicament on cotton tampons in atrophic rhinitis, also applied by cotton applicators to the mucous membranes of the nose after the crusts are removed.

On account of being found in nearly every home, and its importance as an antiseptic, makes carbolic acid added to boiled water (40-60 mins. to Oij) an excellent cleansing solution for the ear. In 4- to 10-per-cent solutions in glycerin (warmed) it is dropped into the external auditory canal in acute otitis media to allay the pain. The canal is filled, a piece of cotton placed in the ear, and then external heat applied. The frequent use of the strong percentages (10 to 12) is not advisable, for it is claimed that thickening of the drum membrane and diminution of hearing may result. However, in 6- to 8-per-cent solutions, even if used frequently, nothing will result from the chemical trauma, except possibly later on a partial exfoliation of the epidermis.

Carbolic acid combined with tannic acid, glycerin, oil peppermint, and water makes a gargle useful in acute tonsillitis, and a good preparation to employ after operative procedure upon the throat in adults.

Where a large perforation exists, or the drum membrane has been mostly destroyed and the aural discharge has an extremely foul odor, the boracic acid alcohol drops are of much benefit.

Boracic acid, grs. xx;
Ethyl alcohol, oz. j.

After the canal is cleansed and dried a diluted solution of the above is dropped into it and allowed to remain until all smarting ceases. It is best to start with a dilution of one to three and gradually increase until full strength is used. This solution in time will shrink the granulations, harden the tissues, and usually lessens both the odor and amount of the discharge.

Alcohol properly diluted makes a good astringent and antiseptic gargle for adults. The following is one of the best formulas:

Alcohol (ethyl),
Cinnamon water, ää ounce ij;
Formaldehyde, mins. ij;
Glycerin, drachms v;
Distilled water, q. s. ounce viij.

Oily solutions are of very little value, if any, for cleansing the nose, but serve for protection to the mucosa after the use of watery sprays or irrigations. The continuous use of oily sprays is apt to produce a feeling of dryness, on account of depleting the mucous membrane of moisture.

Aromatic, stimulating, and antiseptic drugs may be added as indicated, and the solution can either be dropped into the nose, or by the use of an oil spray or

nebulizer inhaled. The effect as a rule is for temporary relief, very little being accomplished toward curative measures. The following formulas are useful:

(1) Menthol crystals,
Camphor gum, āā grs. ij-x;
Bland petroleum oil, ounce j.

(2) Chloretone, grs. v;
Camphor,
Menthol, āā grs. x;
Oil cinnamon, mins. ij;
Refined liq. petroleum, ounce j.

This last preparation should be diluted, unless used with a nebulizer giving a fine vaporization.

Chloroform, carbolic acid, oil of thyme, oil of eucalyptol, oil of rose, oil of pine, aristol, acetozone, and other drugs may be used in various formulas.

During the past two years many formulas of nasal ointments have been put up in collapsible tubes for individual use. However, it is difficult for the patient to get the ointment to stick to the mucous membrane of the nose; it is either soon blown out or drawn into the nasopharynx and expectorated. Better results are obtained by having the application made just inside of the vestibule of the nose, where the ointment melts from the body heat and the medicines are drawn along the membranes. When crusting is present an ointment containing ichthyol may be massaged over the dried secretions to loosen the crusts and to stimulate glandular functions.

Boracic acid, zinc oxide, eucalyptol in petrolatum is an excellent preparation for use in infections of the vestibule of the nose, either in infection of the hair follicles or fissures of the epidermis.

Tubes of sterile vaselin are convenient to soften crusts which collect in the vestibule and following some operative procedures.

Para-amido-ethyl-benzoate, 10 per cent, with adrenalin chloride, 1:20,000, in a bland oleaginous base, is useful where an astringent, anesthetic ointment is desired.

Ichthyol, drachm j,
Ungt. zinc oxide, drachms iij,
Petrolatum, q. s. ounce j,

is indicated in acute eczema of the ear where the inflammatory reaction is well marked.

Carbolic acid, gtts. iij,
Ungt. zinc oxide, drachms iv,
Petrolatum, q. s. ounce j,

is indicated in auricular eczema where there is an abundance of pus.

Numerous cold and coryza tablets are at command; it is nearly impossible to add to the already abundant formulæ. Some individuals cannot take quinine; a few tablets containing one-tenth of a grain will cause disturbance. In such instances atropine sulphate, morphine sulphate, powdered camphor, and tincture aconite may be employed to suit the individual case.

In painful deglutition following throat operations, tonsillitis, tubercular and cancerous conditions of the throat, anesthesine lozenges frequently afford great relief. Where a simple throat astringent is desired red gum and catechu compound answers very well. The chloroform throat lozenge requires only mentioning, for its efficiency is well known.

NITROUS-OXIDE-OXYGEN ANALGESIA IN OBSTETRICS: A CONTRAST.

In the *New York Medical Journal* of April 29, 1916, as a result of the use of nitrous oxide and oxygen, Dr. F. K. Camp, of Oklahoma City, concludes:

1. That the time of labor was materially shortened, owing to the fact that the pains were so often more frequent and stronger, and partially, at least, to the fact that during the expulsive stage the patient, feeling no pain, brought the secondary muscles of expulsion to their best work.

2. Perineal lacerations with nitrous oxide gas, when given by an experienced administrator, were less frequent. This was due to the fact that when the head was on the perineum, the gas could be increased, temporarily slowing the contractions, and giving the tissues time to stretch. Dr. Davis had stated that in forty-four primiparæ to whom gas was given in the hospital, twenty showed some degree of laceration, or forty-five per cent, while with sixteen

primiparæ without gas, there was some degree of laceration in twelve cases, or seventy-five per cent.

3. In Camp's series of twenty-five cases all the babies cried as early and as vigorously as those who did not receive gas, and showed no signs of anesthesia.

4. Convalescence in those patients was in every way smoother and quicker than he had ever seen in a corresponding series of cases. More patients left the hospital under ten days after delivery than over twelve. Multiparæ were generally out of bed on the fifth day; primiparæ up in a chair on the sixth or seventh day. Dr. Davis attributed the rapid convalescence to the absence of shock under nitrous oxide gas analgesia.

5. The expense of the gas to produce the desired analgesia should not enter seriously into consideration, as in his series of cases it did not exceed ten dollars an hour, while the average time of giving the gas did not exceed three hours.

6. Unlike twilight sleep, which, its advocates state, should be used only in a hospital, nitrous-oxide-oxygen analgesia might be administered in the home, and portable gas machines for obstetrical work are now being manufactured. In these days of automobiles the doctor has little excuse for not adding this apparatus and method to his armamentarium.

ACUTE POLIOMYELITIS.

In the *Lancet* of April 15, 1916, BATTEN states that recognizing that poliomyelitis is an acute specific fever, having an incubation period of four to twelve days, the patient should be isolated. The infectivity is very slight, and in hospitals it is not necessary to place the patient in a separate ward, bed isolation being sufficient to prevent the chance of infection. As the virus is known to exist in the nasal and buccal mucous membrane, it is essential to pay careful attention to the discharge therefrom.

It has been shown experimentally that the serum of patients who have recovered from an attack of poliomyelitis has the power to destroy the virus *in vitro*, but that this immune serum has no power to prevent the development of the disease when injected simultaneously or after the virus has been injected. Flexner and Amoss have shown that intraspinal injection of an immune serum is effective when introduced in the preparalytic stage in delaying and preventing poliomyelitic infection in a monkey. This method of intraspinal injection of immune serum has been used with success by Netter in cases of poliomyelitis of the acute ascending variety. The method is as follows:

Some 20 to 30 Cc. of blood is obtained by venipuncture from a patient who has passed through an attack of poliomyelitis (the length of time after the attack is not important, for it has been shown that the blood preserves its antitoxic properties for several years). The serum is separated by allowing the blood to clot and by centrifugalization. Lumbar puncture is performed on the patient, and an amount of cerebrospinal fluid removed corresponding to that of the serum which it is proposed to inject—usually about 10 Cc. The serum is now slowly injected, and the bed of the patient tilted so as to allow it to gravitate cerebralwards, the injection being repeated daily for three to four days.

There is little or no difficulty in carrying out the treatment. The difficulty is to obtain an old case of poliomyelitis who has already been tested and given a negative Wassermann and who is willing to give the necessary blood at the same time as a suitable case of acute poliomyelitis presents itself for treatment. It is useless to carry out the treatment when the disease has already become quiescent, and the most suitable cases are those (1) presenting symptoms of an ascending or progressive poliomyelitis; (2) presenting meningeal symptoms; (3) in the preparalytic stage (if the diagnosis can be made).

Since animals are immune to poliomyelitis virus, the possibility of employing the sera of animals has been considered; but Flexner and Lewis found that the sera of

horses and rabbits had no viricidal action; sheep's serum was slightly active and might be increased by injection of the virus, but the degree of activity is small.

There can be no doubt that rest is the most important factor in treatment: the too early movement may in some cases restart the disease which has become quiescent. A child with an acute attack of poliomyelitis should be kept absolutely at rest in bed for at least three weeks. The principle by which physiological rest can be secured to the muscles is to be considered, and the conclusion arrived at is that the paralyzed muscles must be put into the "zero position," a position defined by Mackenzie as that in which the individual muscle itself is relaxed and both its own action and that of its opponents prevented. Sherrington has shown that postural contraction which counteracts the effect of gravity can be maintained for long periods without fatigue, and a position which can be maintained without fatigue must be a position of rest.

Various methods have been adopted for keeping the affected muscles at rest. Most of them tend to immobilize the patient for many months. It is important whilst keeping the completely paralyzed muscles in a normal zero position, and at rest, to encourage other muscles, which may have been more or less affected, to resume their normal function. This is accomplished by reëducation. The erect position and walking are the best forms of reëducation for the trunk muscles. The method of reeducating the severely paralyzed muscles is described below.

The practical application of the above principles has been carried out by placing the paralyzed limb or limbs in celluloid splints, accurately fitted to the limb as soon as it is possible to make the cast after the onset of the disease; as the splint is to serve in most cases not only for keeping the muscles at rest, but also as a support in walking, it is important that the position of the limb should be such that progression is possible. These splints were first used by Calot, and introduced into England by Gauvain, who has used them in the treatment of tuberculous joints.

The splint is molded on a plaster-of-Paris cast of the limb, and it is the taking of this cast that is important; for the limb must be in the zero position, or, in other words, the position normally assumed to counteract the effect of gravity when the patient is in the erect position. That position, so far as the legs are concerned, is one of slight flexion of the knees with the foot at a right angle, or an angle slightly greater than a right angle, to the tibia.

The advantages of this form of splint are: (1) They maintain the muscles constantly in a position of rest, for they can be worn day and night; (2) they do not immobilize the patient, so that walking exercise can be carried out without the liability to produce deformity or stretching of the muscles; (3) they are easily removed and replaced so that other methods of treatment can be carried out; (4) no special boots or shoes are required.

In reëducating a severely paralyzed muscle it is important in the early stages to place the limb in such a position that the load on the muscle is at its minimum, and only a very small force is required to overcome the effects of gravity. A bath is an excellent place to practice the reëducation of badly paralyzed muscles; for the weight of the limb is supported and ranges of movement are possible which without the support of the water are impossible. Walking exercises and the erect position are the best forms of reëducation for the trunk and abdominal muscles. When once the legs are splinted it is possible to get the patient into the erect position, and this allows of the physiological use of the back, trunk, and pelvic muscles. Such walking exercises are carried out by the use of a walking machine which supports the patient both physically and morally; for it is important to give the patient the feeling of complete security.

Other methods of treatment are by massage, electricity, and baths. The surgical treatment is not dealt with here.

During the last four years these postural

and reëducational lines of treatment have been carried out in all acute cases with the result that very few deformities have arisen. Such as have occurred were due to the contraction of the flexor group of muscles at the hip.

The adoption of the practice of placing the limb in a position of rest at an early stage of the disease will not only facilitate recovery, but prevent the greater proportion of deformities now seen as the result of poliomyelitis.

THE USE OF UNDILUTED CITRATED MILK IN THE FEEDING OF INFANTS.

CARTER writes on this subject in the *Practitioner* for February, 1916. He tells us that when he commenced this work he found that mothers did not realize the importance of measuring the quantities of food that they were giving to their babies, so that all elaborate mixtures had small chance of success. Professor Budin's experiment in Paris with undiluted sterilized milk prompted Carter to try a similar experiment in Kensington, substituting citrate of soda for the process of sterilization. In both instances clotting of the milk is prevented. Carter followed Budin's directions with regard to the quantity of milk to be given, viz., one-tenth of the body weight, but he soon found that the general condition of the child was a better guide than the body weight as to quantity, and that it was always safest to begin with small amounts, and gradually increase. Another point he found of great importance was to insist on clock-like regularity of feeding, and to make the intervals between the feeds as long as possible, so that the stomach was empty before the next meal. In order to insure regularity, it was necessary to write down the times of feeding on a card, which was handed to the mother, or whoever was in charge of the child.

Contrary to the generally accepted method of giving two grains of citrate of soda to each ounce of milk, Carter gave only one grain, and this was usually sufficient. He told the mother to add another grain if vomiting occurred. No specially prepared milk was used. He instructed the mothers to receive the milk in a clean jug, and then to place the jug in a saucepan of water, and allow the water to boil for five minutes. It is important that the milk should not be placed in a saucepan and boiled, because the "family saucepan" has a great deal of work to do in the houses of the poor and can rarely be called clean. After the heating process he advised that the jug should be covered over with a piece of muslin or clean paper, and the edges bound round with string; the jug now should be placed in a basin of cold water until required for use.

Each meal was prepared separately, and he found that this had a most excellent educational influence. Women who formerly had never thought of looking at the marks on the feeding bottles, or at any other form of measurement, now became interested, and for the first time in their lives realized the importance of quantities. Carter merely mentions these details to show how difficult work is amongst the poor and ignorant, whatever form of feeding is adopted, and he used whole citrated milk quite as much for the benefit of the mother as for the child. The value of this lesson has been fully justified in the case of many young mothers, whose subsequent babies progressed better than the first, because the mothers were able to carry out more elaborate formulæ, which, in many instances, produced better results than the whole-milk process. There can be no doubt that he got good results, on the whole, with undiluted citrated milk when he used it as a routine method during the first two or three years, but he has got much better results during the last six years by abandoning all routine methods and concentrating more on the individual requirements of the case.

The most successful case of feeding on whole milk occurred amongst wasted infants, and this is rather what one would expect. These cases had mostly been fed on very dilute mixtures, often containing

no additional fat or sugar; they commonly suffered from dilated stomachs, accompanied by vomiting and diarrhea. The citrated milk, on account of its small bulk, is particularly suitable in these conditions, and the excess of proteid can, no doubt, readily be utilized by the tissues for building up the framework of the body in cases of starvation. It is certainly a remarkable fact that the digestion of a weakly child is able to deal with whole milk, when all clot formation is prevented by the addition of citrate of soda.

Carter was not, however, satisfied that these good results were entirely due to whole-milk feeding, so he arranged to feed another series of wasted infants on mixtures of varying amounts of cow's milk, water, sugar of milk, and a "cream solution" consisting of equal parts of linseed oil and lime-water. In this latter series of cases he paid special attention to the intelligence of the mother. The exact amount of each constituent was carefully explained to her, and, in addition, the composition of each feed and the times for feeding were written down on a card, which she took home with her.

At the next and subsequent weekly visits the mother was cross-examined with regard to the quantities which she put into each bottle. It was evident that, when the child progressed, the mother took an increasing interest in the variations of each constituent of the diet, because she saw that it "paid."

Carter included 30 cases in each group, and they were under observation for three months. All the babies were young, and the general environment was very similar in both groups.

On comparing the results of these two groups, he found that the whole-milk feeding produced a more rapid rise in weight than the diluted milk feeding. In three instances the rise in weight of one pound a week was alarming, and he found that the mothers had not been attending regularly, and had increased the food without advice, with the result that, in two cases, the children became very ill, but did not die.

The weight-curve in the diluted milk series showed a more gradual rise, and the babies did not have any violent upset. The muscular development showed good progress in both groups amongst those who attended regularly, but here, again, the muscles showed a more rapid increase in the whole-milk babies.

Carter saw some of these cases when they were eighteen months old, and there were no signs of rickets in either group. Another difference was, that these observations were made in the winter months. In hot weather he has often had bad results, both with citrated and with dilute milk mixtures. He believes it is impossible to keep milk from becoming contaminated in the home during the summer-time, and, therefore, he puts all the children on a dried, full-cream milk while the warm weather lasts.

THE USE OF STOCK VACCINE IN INFECTION BY THE BACILLUS TYPHOSUS.

The *Lancet* of April 8, 1916, contains an article by WHITTINGTON on this topic. He states that in a total of vaccinated cases there were 29 in which it appeared that vaccine had a definite good influence. Of these, 20 belonged to Classes 3 and 4—*i.e.*, to those classes in which the prognosis is good. In other words, "good results" are more often obtained where good results can be expected by ordinary methods of treatment alone. On the other hand, the mortality rate and the average length of fever in these classes were slightly worse among the cases which had vaccine.

Among the cases belonging to Classes 1 and 2 in which the vaccine appeared to do good, none had severe lung involvement. Those cases which had much bronchitis or bronchopneumonia (the average severe case) ran the severe course which is usual and vaccine appeared to be of no avail. To say that if the average severity of the cases treated had been less the vaccine would have had better results is merely to say, Whittington thinks, that the cases would have done better anyhow.

From all this it would appear (*a*) that it is in just those cases in which the physician so much requires help that vaccine is disappointing; (*b*) that vaccine neither shortens the fever nor reduces the number of complications in even that class of case which is likely to do well; and (*c*) that there is a decided suspicion that vaccine increases the incidence of hemorrhage.

Therefore the conclusion is that the use of a stock vaccine in typhoid cannot be recommended as a routine treatment.

Whittington would add that these conclusions are largely contrary to the impressions which he received during the treatment of the earlier cases. He had not then seen a sufficient number of similar cases which did well without vaccine, and being rather biased in its favor he gave undeserved credit to this treatment.

THE PHYSICS OF A SURGICAL DRESSING.

PRIMROSE (*British Medical Journal*, Feb. 12, 1916) holds that the best dressing for a septic wound is the moist dressing, and regards hypochlorous acid solution as wonderfully effective. Everything should be done to favor free evaporation and absorption into the dressing, which should be frequently changed. Primrose believes it would be greatly to the advantage of the wounded if impermeable protective and oiled silk were entirely removed from the surgical armamentarium of the army. He states that he has seen dozens of cases in a short time of the employment of impermeable coverings over moist dressings. He observes that by far the majority of all septic wounds admitted have had an impermeable covering. The custom is unquestionably wide-spread.

Primrose quotes Wright's advice to the effect that in the field ambulance there should be applied the wet dressing of 5-percent solution of sodium chloride and 5-percent sodium citrate, and over this dressing should come a layer of impervious tissue. From this method Primrose entirely dissents, stating that his attention was first called to the harmful use of impermeable material such as protective, oiled silk, rubber adhesive, etc., by a paper on the physics of a surgical dressing published about ten or fifteen years ago in the *Annales de l'Institut Pasteur*. He recalls by memory experiments which seem to show that animals prepared by shaving a portion of the skin surface and after excoriating sufficiently to draw blood, would die of strychnine poisoning if this area were covered with impermeable oiled silk so that evaporation of the surface was prevented. Under a simple absorbent dressing no sepsis resulted. Similar experiments with virulent bacteria showed similar results.

SODIUM HYPOCHLORITE IN THE TREATMENT OF SEPTIC WOUNDS.

DALTON (*British Medical Journal*, Jan. 22, 1916) as a member of a committee sent to report on the efficiency of the hypochlorites in the treatment of infected wounds, notes that every wounded patient received on board during this period, whose wound or wounds were clinically septic on arrival, had been treated with the special sodium hypochlorite solution prepared according to Dakin's formula. No other form of antiseptic was employed. Although this report is based on the small total of 57 cases, the results have been so uniformly and consistently good that he thinks it may be useful to publish it now, in order that the hypochlorite solution may be more generally used in the treatment of wounds than is the case at present.

Wounds that were clinically clean on arrival on board were also irrigated with the sodium hypochlorite solution and dressed with gauze soaked in the antiseptic. But these cases are not considered in connection with this report, since they would probably have remained clean and healed with any other form of customary dressing, and therefore cannot be counted as evidence in favor of hypochlorites being far superior to any other form of antiseptic that they have so far used on board the ship.

The antiseptic solution is made on board from dry carbonate of soda, bleaching powder of good quality, and boric acid, according to Dakin's directions given in the *British Medical Journal* of August 28, 1915. The solution was made in large carboys holding about 40 liters.

Five hundred and fifty grammes of the carbonate of soda were dissolved in a carboy half-filled with fresh water; 800 grammes of bleaching powder were then added, and the mixture thoroughly shaken for five minutes. The carboy was then filled up with fresh water, and, shaking the mixture once more, it was allowed to settle for half an hour. The clear fluid over the precipitate of calcium carbonate was siphoned off as completely as possible, and filtered into a second carboy by passing through a plug of cotton in the neck of a large funnel; 150 grammes of boric acid were added to the filtrate, and the mixture was then ready for use. It was drawn off from the carboy as needed by means of a siphon.

The solution was never kept longer than a week, and any unused solution that had been made longer than a week was thrown overboard. This waste is a matter of no moment since the cost of the preparation is so extremely small.

The usual surgical procedures were adopted for enlarging the wound, making counter openings, removing portions of detached bone, foreign bodies, including bits of clothing, fragments of shell, bullets, etc. Every portion of the wound was then thoroughly irrigated with large quantities of the hypochlorite solution. One or several rubber tubes, according to the nature of the wound, serving for the introduction of the hypochlorite solution, were then inserted, and strips of gauze arranged around the tubes and lightly packed into every portion of the wound. It is essential that this should be properly done, the idea being that the gauze strips function simply as wicks to convey fresh hypochlorite during subsequent treatment to every surface of the wound.

The outer surface of the wound is then dressed with gauze lightly wrung out in the hypochlorite solution. The ends of the rubber tube or tubes are brought out through the gauze dressings, a bandage lightly applied over all to keep the tubes and dressing in position, and the ends of the tubes brought out through the bandage, to serve for the subsequent renewal of the hypochlorite.

In profoundly septic cases the hypochlorite solution is injected into the tubes, by means of a glass syringe, every two hours for the first twenty-four to forty-eight hours, and subsequently less frequently as the wound begins to clean up. In less severe cases they find by experience that syringing with hypochlorite at four-hourly intervals suffices. Each case should be treated, so far as frequency and quantity of hypochlorite administration is concerned. The object aimed at is to supply every surface of the wound with a sufficiency of fresh hypochlorite solution as often as required.

In bad cases the gauze strips are renewed after the first twenty-four hours. With slighter wounds they may be left in for three to four days, and then usually do not need to be replaced by fresh strips, as the wound generally cleans up with simply occasional squirting of fresh solution into the tubes.

A SIGN OF FRACTURE OF THE PELVIS.

COOPERNAIL (*Medical Record*, March 4, 1916) states that in practically all cases of fracture of the pelvis there will appear in from one to three days a more or less extensive ecchymosis of the perineum and scrotum in men, perineum and labia in women. In cases of not very extensive fractures of the crest of the ilium this sign may not be present.

In fractures of the pubic portion of the pelvic ring (which is the most common fracture), invariably one will find ecchymosis of perineum and scrotum inside of three days.

The diagnosis of fractures of the pelvis in many cases is far from easy. Localized

tenderness at the seat of fracture may be the only sign present at the time of injury. Crepitus, the cardinal sign in so many fractures of other bones, is often absent, and in most cases there is comparatively little or no displacement.

This sign does not compare with the *x*-ray in diagnosis of fractures of the pelvis, but it will be found to be of interest, and will be a help to make a diagnosis before using the *x*-ray.

Ecchymosis of the perineum will be found present in a much larger percentage of cases of pelvic fractures than is ecchymosis behind the ear and under the conjunctiva in cases of fracture of the base of the skull (Battle's sign), to which it is analogous.

PROGRESS IN GYNECOLOGY.

RUSHMORE (*Boston Medical and Surgical Journal*, Feb. 24, 1916) observes that the present enthusiasm for radium as a standard for operation in the treatment of cancer of the uterus is not soundly based on fact. The radical operation in the hands of competent men still gives the best results in spite of the high essential mortality. Cobb's report upon the review of the work on cancer of the uterus at the Massachusetts General Hospital is distinctly serviceable, he noting that of six cases operated on over five years ago by the complete method five are well. The combination of ether with spinal anesthesia is deemed very satisfactory. The growth is curetted or cauterized at the time of operation or a few days before. The ureters must be widely freed. The tying of the internal iliac artery is advocated and employed, especially in the cases of ineradicable growths. After operation the peritoneum should be closed off entirely from the field of operation, and the extraperitoneal raw area should be drained by a small piece of iodoform gauze which does not come in contact with the ureters. Salt solution is given freely by the rectum, and the bladder is cared for by the use of urotropin and an inlying catheter.

Zweifel strongly advocates secondary operations. His indications for operation are that the tumor or recurrence must be sharply defined on all sides, and only a small part of the periphery may be attached to the pelvic wall; involvement of the bladder does not preclude operation; immobility of recurrence is often due to connective tissue and not to actual tumor growth. Zweifel found 20 cases in which secondary operation was possible, in three of which there was no recurrence on microscopic examination of the nodule removed. In the 17 remaining cases, five survived operations for periods from four years and five months to ten years and eight months. One of these patients underwent five operations for recurrence, and at the age of seventy-five was free four and one-half years from the latest. Three cases died as the result of operation, one of septic peritonitis, the second of an abscess which burrowed from the abdominal incision, and the third on the fifty-third day from embolus following phlebitis of the left leg.

The high percentage of cures in those cases in which exploratory operation showed removal to be possible, suggests the advisability of more frequent resort to such method of treatment.

Much has been written on the use of radium in the treatment of cancer of the uterus, but the known results can be stated briefly. Ransohoff advocates its use in inoperable cases, in which it gives great relief. Some of these cases may prove later to be cured. He does not accept Kroenig's dictum that it should be used in every case to the exclusion of operation, though all acknowledge that the five-year limit only will show the final test.

The line of treatment laid down by Ransohoff is in accord with the practice of most operators at the present time, to operate in cases in which the growth seems eradicable. While not in favor of preoperative radiation on account of material increase in the difficulty of operation, he advocates postoperative treatment as a prophylactic measure against recurrence. If radium is effective for three and one-half centimeters only, even this range of

applicability would cover most of the operable cases. If the carcinoma has advanced more than this distance the case is a borderline case, one of those which the surgeon so often wishes he had not attempted when he gets down to the growth.

Pinch, the medical superintendent of the Radium Institute of London, says cancer of the uterus is favorably affected by radium, both in inoperable and operable cases, though it is not proper to speak as yet of a cure. If extensive operations have been carried out, great care is necessary in the postoperative use of radium, employing smaller amounts and thicker screens. Unless these precautions are observed, a severe and extensive destructive reaction may follow. This may be attributed to operative interference with the trophic nerves in the pelvis. If radium has been applied to the vagina, douches should be used night and morning for six weeks, at least, to prevent adhesive vaginitis. In some extremely susceptible cases a transient proctitis has been noted after the intra-vaginal treatment.

Von Seuffert states that no method hitherto described gives as satisfactory immediate results in cancer of the uterus, whether the case be operable or inoperable. There is no doubt that a number of patients now living two years after radium treatment are clinically as well as if no cancer had ever been present. There are few free for over five years. It is recognized at present that the depth of penetration is an important factor. Some cases of glandular metastasis have survived operation more than five years without recurrence, and tests of the penetration of radium indicate three and one-half centimeters as its limit.

Through recent refinements in technique, the effects of radium in the body can be controlled so that there seems to be a so-called elective or specific action on carcinoma cells.

Allman commends radium, but comments adversely on the use of cholin, which has been so strongly recommended by some, on account of the disagreeable constitutional symptoms of which the patients complain.

Cheron and Rubens-Duval prefer massive doses and report favorable results. For metropathies at about the time of the climacteric, *x*-ray gives excellent results in the hands of all who have tried it. Radium or mesothorium seems to be no better, not indicated, or more dangerous, though few had used them for this condition. For myomata the results are very good if bleeding is the only symptom and no complications are present.

Kroenig recommends radiation except in cases of younger women in whom enucleation is possible.

Radiation gives immediate results, which are favorable in most cases of inoperable cancer. Abbe and Kelly report successful cases of fibroid. Marek treated by radium chiefly those patients in whom operation is contraindicated. In 16 cases nine were cured, four were improved, and three were failures. Kroenig and Gauss alone claim one hundred per cent of cures. In a series of operative cases by Marek in which 104 were abdominal and 18 vaginal, there were three deaths, which were attributed to the advanced stage of the disease rather than to the operation. In a second series of 125 cases there was one death, following a vaginal myomectomy; death occurred on the sixteenth day from pulmonary embolus. Even with low hemoglobin the patients do well. Operation is performed with the hemoglobin as low as 20 per cent. Supravaginal operation is preferred. The more thoroughly malignancy is looked for the more thoroughly it is found, Bumm claiming as high as 10 per cent.

Gardner reports 55 cases of round ligament suspension of the uterus in which the Gillian operation or some of its modifications was used. In all of these the retrodisplacement was the predominant lesion, though other conditions demanding treatment also occurred, as laceration of the cervix and perineum, and adhesions of tube or ovary. Forty-one were entirely relieved; in six, anatomical but not symptomatic cure was the result. In no case in which examination was made was the uterus out of position. The technique followed was median incision to peritoneal cavity; ex-

posure of sheath of rectus on each side of the median line; puncture of the rectus and underlying peritoneum about an inch from the median line and one and one-half inches from the symphysis; through this perforation the round ligament was drawn and sutured to the fascia. In some cases there was oblique puncture of the muscle to the internal inguinal ring. The puncturing instrument then passed along the round ligament and through the peritoneum at the point at which the round ligament was to be grasped. When drawing the round ligament out obliquely in this way certain objections to the technique are avoided.

Williams concludes that the perineum and the levator ani muscle have little to do with the support of the uterus. He concludes that the supports of the uterus and the bladder are intimately connected or identical, and that the uterus receives its support at the level of the supravaginal cervix from the pelvic fascia. He emphasizes the importance of fascia in the operation for radical cure.

ANTHRAX.

ULLMAN (*Surgery, Gynecology and Obstetrics,* April, 1916) states that the bacillus of anthrax usually enters by way of the fingers, hands, forearms, face, head, or neck. Probably the first symptom noticed is the irritable, burning point at the site of infection. The redness at this point spreads; at the same time the swelling increases. There may be also red lines under the skin radiating away from the point of infection, and the spot becomes increasingly tender.

The patient complains of weakness, malaise, rarely more than chilliness, though there may be a moderate rigor, headache, and occasionally vomiting.

If the infection is located in the stomach, obstinate vomiting will very likely be present. In the intestinal type, persistent diarrhea is a marked feature. The pulmonary type gives the symptoms of pneumonia, frequently with cyanosis and collapse. Brain symptoms such as coma or convulsions may be present in any of the above-mentioned types, though usually the patient remains conscious throughout the attack. The febrile curve is not unlike that of other acute infectious diseases—usually ranging from 102° to 105° F.

The occupation of the patient is significant. The condition should be differentiated from furuncle, carbuncle, erysipelas, and malignant edema. The furuncle is conical, does not form vesicles, and its areola is not edematous. The slough is not dry, or dark in color. In erysipelas the sharply defined edges of inflammation, the higher fever in the beginning, and earlier prostration will usually differentiate the two. In malignant edema there is the definite history of injury, marked pain, rapidly spreading gangrene, and emphysema, terminating in twenty-four to forty-eight hours.

Of course the smears or cultures from the point of infection will show the bacillus anthracis and clear up all doubt.

In some instances, before we are able to obtain the organisms, the diagnosis is possible by means of the Ascoli reaction by precipitin. The "ring formation," a peculiar cloudiness, appears promptly and distinctly by employment of the extractive substances from the spleen.

In taking up the treatment the prophylaxis is of the utmost importance. All discharges from the animal or patient should be thoroughly disinfected or burned. The bodies of animals or human beings dying of this disease should be covered by wrappings soaked in an efficient disinfectant and burned. No post-mortem examination should be allowed. Flies, mosquitoes, and other insects have been shown to convey the infection and should therefore be guarded against. It has been shown by Osler that the ordinary processes of tanning do not affect the spores. Animals may be protected from infection by vaccinating with attenuated, non-spore-forming cultures. Every farmer is familiar with this method.

The curative treatment is admitted by all to be essentially surgical. Wide incision at

the point of infection with efficient drainage, and hot, moist, antiseptic applications, if instituted early, offer the greatest hope of recovery.

Of course all sorts of medication have been tried. Some propose emesis and purgation in order to free the alimentary canal from as many bacilli as possible. Others hope to obtain the same results by the use of quinine (in doses of from 15 to 60 grains per day), or by combining quinine and carbolic acid; or the use of a solution of iodine and potassium iodide internally.

Injections of a 5-per-cent solution of carbolic acid into the tissues at the outer edges of the edematous area are claimed to be of value.

Probably the administration of Sclavo's serum offers more hope than any other agent. Sclavo states that he relies upon this alone. In a large number of cutaneous cases his mortality-rate was only 6.09 per cent as compared with 24.1 per cent for all cases in Italy.

Sclavo recommends the use of doses of 40 Cc. divided into four parts; but Bandi (quoted by Keen) has used as much as 150 Cc. Bandi contends that the method of Sclavo fails because there is not a sufficient quantity of the antitoxin to neutralize the virulence of the poisons of the disease. Kept cool in a dark place the serum remains fully active for at least two years.

Bouchard and Carrhin claim that the toxin of bacillus pyocyaneus has a curative effect in anthrax. The injection of this toxin, or the use of the carbolic injections, should be undertaken if the serum cannot be had.

RUBBER GLOVES.

Morris (*Medical Record*, March 4, 1916) discusses this subject as follows:

First, let us take up the matter of principles. According to the fundamental ideas of the third or pathological era of surgery, the operator was to remove bacteria and their products most thoroughly from any infected area. This called for a degree of technical work which represented progress, but nevertheless often proved injurious to the patient. Furthermore, it was frequently unnecessary. We are now passing into the fourth or physiological era of surgery.

The main idea about which our new methods are grouped consists in giving the patient the mildest attack of surgery which will suffice for turning the tide of battle between bacterium and organic cell. It is the idea of conserving the patient's energies and turning him over to himself as expeditiously as possible—in other words, giving him "home rule." Most surgeons cannot introduce their nicest manual technique when wearing gloves.

The methods of the fourth era of surgery include the idea of the least possible degree of handling of sentient tissues, and the shortest incisions which will suffice for accomplishing an object without jeopardizing any of the patient's interests. Furthermore, rapid work is desirable in order to avoid sending prolonged destructive influence into the patient's centers of consciousness, which are never wholly asleep, no matter what degree of anesthesia may be employed. Regarding this, Dr. T. L. Bennett says that the best surgeon is the one who acts all of the time as though he were afraid of waking the patient.

In order to follow the principles of this fourth era of surgery, one needs to depend very largely upon the sense of touch. We often have to work by touch in a class of cases in which the phrase "expose all of the pathology" belongs to the third or pathological era of surgery, now passing. It is better not to expose all of the patient's pathology in many of these cases in which we already know what that pathology is, and what the patient will be able to do with his repair machinery if he is not shocked too deeply.

In some cases a large incision and tedious technical ideal work will allow many more bacteria to fall into a wound from the air than would be carried in by well-prepared surgical hands.

This matter of careful preparation of surgical hands is sometimes neglected by men who put too much confidence in their rubber gloves. Morris states that he would

not advocate any idea which jeopardized the patient's interests. On this basis he made at one time a quiet examination of hospital records of a number of surgeons who worked without gloves, and of a number who worked with gloves. Some of those who depended upon careful preparation of the hands had fewer cases of infection than were recorded against other operators who used rubber gloves in all of their operative work.

The advantage of working by the sense of touch in preference to the sense of sight in certain cases has been recognized by surgeons since the earliest days of surgical history. The sense of touch is dulled by the best of gloves.

The operator in a case of perforated ulcer of the stomach, working by sense of touch, may introduce drains down to the region of perforation and complete his preliminary operation in three or four minutes of time, leaving subsequent details for a secondary operation.

In typhoid perforation, or in cases for drainage of the fluid belonging to parenteral anaerobes in typhoid hemorrhage, the entire operation from first incision to last suture may sometimes be done in seconds instead of minutes when one is working by the sense of touch.

When removing firmly adherent organs like oviducts in cases of pyosalpinx, or the appendix in acute infective cases, work may be done through short incisions by aid of the sense of touch very rapidly and accurately. Long incisions naturally predispose to the development of postoperative hernia, if the patient has the luck to live and face that danger.

For cases in which we need to be particular about scarring, one will often work to advantage through incisions which could not be employed if the sense of sight were our chief dependence.

On the other hand, rubber gloves may be worn to advantage in almost all of the so-called "external operations," such as amputations or excisions, or hernia. Surgeons there be who are not well trained in the principles of asepsis or of antisepsis, yet who are doing a great deal of operating. For such operators he prescribes the employment of rubber gloves under all circumstances.

RENAL AND URETERAL CALCULUS.

CABOT (*Transactions of the American Association of Genito-Urinary Surgeons*, vol. x, 1915), dealing with errors in diagnosis of renal and ureteral calculus, notes that of 150 cases in which the urine was carefully examined, in 21 it was found to be entirely normal. Stone in the ureter is more likely to be accompanied by normal urine than when the calculus is placed in the kidney. Abdominal pain entirely without colic was the presenting symptom in 13 of the cases, while backache was the chief complaint in 11. In 12 the pain was in the right lower quadrant.

On these 153 cases 26 abdominal operations had been done without relief of the symptoms, which were clearly due to the overlooked calculus in kidney or ureter.

In 127 cases in which satisfactory *x*-rays were obtained, eight were persistently negative, representing a failure of 6 per cent. He regards 15 per cent as nearer the real percentage of failures.

Pain referred to the stomach and vomiting were the chief complaints in three cases; sacroiliac pain and pain called lumbago in three cases; and pain referred to the bladder in seven. Patients, declared neurasthenics, have been those with abdominal pain, negative physical examination, and a normal urine. Two such patients had stone in the ureter, the removal of which cured the neurasthenia.

In cases suggesting stone in the kidney with normal urine, a negative *x*-ray, and an unobstructed ureter, the wax-tipped catheter will not infrequently lead to a correct diagnosis and will be likely to fail only in the cases in which the stone lies in a dilated calyx and is therefore out of reach of the catheter.

He also calls attention to the fact that all cases of abdominal pain of a chronic or recurring type, cases of backache, lumbar

or sacroiliac joint strain and lumbago, should be subjected to repeated examinations of the urine and should usually have *x*-ray plates taken.

Squier holds that a peculiarity of true renal pain is that it never becomes paroxysmal but is always characterized by dull, constant aching. It is usually associated with local tenderness, best elicited by fist percussion. The pain is located deeply by the patient. Distention of the renal pelvis and upper third of the ureter is associated with urinary frequency, but usually without painful micturition.

PROGRESS IN GYNECOLOGY.

Under this title RUSHMORE (*Boston Medical and Surgical Journal,* March 2, 1916) quotes Kosminski regarding experimental work on the relations of the hypophysis to the genital glands. He also makes a clinical report on twenty cases of amenorrhea which he has treated by hypodermic injections of pituitrin or hypophysin. He has seen no bad effects, and a sufficient number of cases have been cured or improved to make the treatment worth trying, though, as he says, not all cases of amenorrhea without obvious cause are due to defective secretion of the hypophysis. In the present state of our ignorance the injection should be tried, as it seems to do no harm and may do some good.

In the therapy of amenorrhea without obvious cause—that is, without mechanical obstruction, chlorosis, profound anemia, or other constitutional disease—the so-called idiopathic amenorrhea, which perhaps rests on a functional disturbance of the uterus or of the ovary, or of both—Rieck has found the intrauterine plug most useful. The particular form of instrument which he uses as being the most satisfactory he found on the market, invented and put on sale "for preventing conception." It can be easily introduced, and in his series of nineteen cases, over a number of years, has given excellent results. Most of these patients had been subjected to other forms of treatment without avail. The plug is left in for several months, and is retained in place by the constriction of the internal os, which contracts below a small knob at the upper end of the plug. The prejudice against the plug Rieck attributes to the defective mechanical construction of the old forms.

In some cases the plug happened to stay in for several years; in one eight years; then it was spontaneously expelled at miscarriage. Rarely does this give symptoms, but in one case it had to be removed. In a few cases there was complete failure, but in these the plug was apparently left in too short a time. In one patient the plug was removed after seven months of amenorrhea, which has remained permanent. The indications for the use of the plug are amenorrhea or "oligorrhea" of months or years duration.

The use of the intrauterine stem pessary for the treatment of dysmenorrhea and sterility is increasing of late, according to Nicholson. Soon after the introduction of this device it encountered considerable opposition, which has recently diminished. Some operators regard it as perfectly safe, others as requiring great care in its employment, while still others regard it as "unsurgical" and to be avoided unconditionally. Nicholson, whose advocacy of the stem pessary dates back only a few years, reports a case of severe pelvic infection ensuing three weeks after the introduction of a plug in a patient in whom no other source of infection could be found. Ultimately an abdominal operation had to be undertaken with removal of one tube and ovary and resection of the other. While the infection could not be proved to be due to the plug, the absence of any previous symptoms on the part of the patient and entire freedom of infection of the husband, as shown by two examinations, make this explanation seem the most probable to Nicholson. This case calls attention to something with which every operator is familiar, that even a slight and seemingly safe operation may be followed by unexpected and serious results.

Novak, following the suggestion of

Drenkhahn, exhibited atropine in cases of spasmodic dysmenorrhea in young women with gratifying results. In such cases he makes no pelvic examination (generally there is nothing to be made out), but begins the administration of the drug two days before menstruation is expected to appear and continues for two or three days, according to the usual duration of the pain, one one-hundredth of a grain three times a day. If pain appears, the dose is increased unless signs of atropine saturation are present. The dryness of the throat and the itching of the skin are usually easily tolerated. In some cases he has employed other drugs also, as aspirin.

Another drug which gives relief to some cases of dysmenorrhea is citric acid. Given in the form of sodium citrate three times a day, it is claimed to reduce the viscosity of the blood, and thus alleviate the pain of expulsion. Spitzig has found that the nausea, dizziness, headache, and mental irritability are vastly improved, and that clots and membranes (*sic*) are reduced.

SUBACROMIAL BURSITIS.

BRICKNER (*American Journal of Surgery,* April, 1916) on the basis of a personal study of over 100 cases of shoulder disability, including 19 which showed calcareous deposit roentgenologically, 7 of which he operated upon, concludes as follows:

A much-thickened bursal wall casts no roentgen shadow. The shadow is due to a calcareous deposit.

The calcareous deposit is not in but entirely beneath the bursa, in or on the supraspinatus tendon, or occasionally the infraspinatus near its insertion.

The assumption of a bacterial or toxic origin for subacromial bursitis has never been substantiated by any evidence.

Excluding the rare tuberculous form and the metastatic purulent type occurring in septic processes, subacromial bursitis is of traumatic origin. It is produced by bruising the structure between the acromion and the greater tuberosity (over which latter the adhesions and the thickening of the bursal wall are most often found). When the underlying tendon is likewise contused or torn, the lime salts deposit in the area of necrosis that develops in this poorly vascularized tissue.

In the early stages there may be swelling due to serous effusions in the bursa. In later stages swelling in the deltoid region is unusual; more often there is decided flattening due to muscle atony. Tenderness over the outer aspect of the shoulder just over the acromion, where it is usually sought for, is as often absent as present (more often absent). The site of tenderness is most constant in subacromial bursitis anteriorly, over the lesser tuberosity.

The recommendation in text-books to "excise the bursa" is to be condemned.

The subacromial is one of the largest bursæ in the body. Above it is adherent to the under surface of the acromion process and the coraco-acromial ligament, wherefrom it is reflected onto the joint capsule. Below it is adherent to the inner surface of the deltoid muscle, extending fully one and a half inches distal to the greater tuberosity. Anteriorly and posteriorly it encircles almost one-half the circumference of the humerus, and is attached by its under surface to the bone, the joint capsule, the biceps sheath, and the tendons of the subscapularis and the spinati. Surely the complete removal of this extensive, intimately attached structure would be an imposing task! For an attempt to perform it there is but a single indication—tuberculosis.

Calcareous shoulder deposits occur apparently only in adults. Probably some metabolic disturbance predisposes to their formation, and since the condition is not a rare but a fairly common one, it is worth determining, if possible, what that disturbance is. It is clear that those who recommend extirpation of the bursa mean thereby merely removal of the diseased portion. Calcareous deposits in the bursa do not occur, but calcification is a familiar process in necrosed tissues, and has been described

not infrequently in tendons that have undergone necrosis. The cause is probably an injury to the tendon.

TRANSPLANTATION OF BONE IN UNUNITED FRACTURE OF THE SHAFT OF THE HUMERUS.

HENDERSON (*Annals of Surgery*, April, 1916) has practiced two distinct methods: one the intramedullary plug, the other the inlay. The latter he prefers. Of ten patients there were three with musculospiral paralysis at the time of examination. In two the nerve fibers were apparently intact. In another case, paralysis of the musculospiral nerve was produced by excessive manipulation and traction at the time of the operation.

One point of technique which is highly commendable lies in the fact that he applies a spica plaster-of-Paris casing to the shoulder and arm of the fractured side a few days before the operation. This gives as near perfect fixation as it is possible to obtain; the cast embracing the wrist, elbow, shoulder, and thorax. Before putting on this case a dressing is placed on the arm about the size necessary to protect the wound after operation. During the application the wrist is held in mild hyperextension so that it will be retained in this position, the extensor muscles of the forearm being thus relaxed and not stretched. The elbow is put up in a flexed position with the arm rotated inward so that the forearm rests across the front of the body. After the plaster has hardened sufficiently to allow of cutting with a sharp knife, the cast is split into anterior and posterior halves, which can be readily applied and held in place by adhesive strips after the operation is completed. This method is resorted to since it is rather difficult to apply a good plaster spica to the shoulder with the patient asleep.

Inlay grafts are obtained from the flat internal surface of one of the tibias, preferably by the circular motor-propelled saw. They should be long enough to extend well into the sound bone of the ends of the shaft. A graft 6 inches long by ½ inch wide is the ordinary size desired. The failures in Henderson's cases were traced to two causes—too small a graft and inadequate fixation postoperatively and during convalescence. The grafts are held in place by double strands of No. 2 chromic catgut or single strands of kangaroo tendon, placed around the humerus by aid of a ligature carrier. The wound is closed with silkworm and horsehair. The patient is placed in the split spica cast, which is strapped together with adhesive plaster. At the end of two weeks the stitches are removed and a new plaster-of-Paris cast applied. Henderson particularly dwells upon adequate postoperative fixation.

By removing the bone-graft from the flat internal surface of the tibia, the strong crest of the bone is left to perform its important weight-bearing function. The patient may be allowed to walk in from twelve to fourteen days. At this time the blood-clot filling in the bony defect has become sufficiently organized so that no hemorrhages will occur on the use of the leg.

A properly applied spica cast may be comfortably worn for three months, when in all probability union will be complete.

END RESULTS OF UMBILICAL HERNIA.

SIMMONS (*Boston Medical and Surgical Journal*, March 9, 1916) reports on 70 consecutive cases operated upon at the Massachusetts General Hospital. The length of time during which cases were followed varied from one to four years. The cases practically always recur, if they are going to do so, in the first year, and it would seem proper to report all of these cases as end results. There were 15 umbilical herniæ in children and small herniæ in adults which were operated upon incidentally in the course of another operation, but for which the patient did not seek medical advice. There were 43 cases of large umbilical hernia of slow growth in stout, middle-aged adults, usually women. Many

of them were complicated by cardiac insufficiency or pelvic trouble, as prolapse. There were 12 strangulated herniæ.

The operation was performed as follows: An oval transverse incision is made about the umbilicus, including the hernia mass. This is carried straight down to the fascia. The mass of fat and hernia is then dissected toward the ring, keeping close to the aponeurosis, and all hemorrhage from the small perforating veins carefully controlled. By keeping gentle traction on the hernia mass, these can usually be seen and clamped before being cut, and the operation in this manner is done almost bloodlessly. The dissection is carried to the edge of the ring and the anatomical structures developed until finally the mass of hernia and fat can be lifted up, being attached to the body only by the sac. The sac is then opened, close to the ring, the contents freed from adhesions and returned to the abdominal cavity, or, if omentum, excised. The ring is then closed by the Mayo method, transversely, with an overlap from above downward, by five Pagenstecher mattress sutures. Especial care should be taken in closing the ends of the wound, as it is at this point that recurrence is particularly likely to occur. In some cases the peritoneum may be closed by a separate stitch, but it is usually impossible, as at the umbilicus the peritoneum is very friable and difficult to differentiate. The free edge of the aponeurosis is caught down with chromic gut sutures and the wound closed with buried catgut sutures in the fat to obliterate the dead spaces.

Ten of the Group I cases were followed, and all of them remained well. In such cases it makes very little difference what operation is performed since it is always successful. In the second group, two of the 43 cases died following operation. In one fatal case hysterectomy was done at the same time. Thirty-nine of the cases have been traced. To these have been added six cases of strangulated hernia which survived the operation, a radical cure being attempted at the time of intervention. Of these 45 cases the hernia recurred in 10. In 30 cases the Mayo operation was performed, with three recurrences, or 10 per cent. In the fourteen cases in which the ring was closed vertically, with or without overlapping of the aponeurosis, six recurred, or 42.8 per cent. The only case closed transversely, without overlapping, recurred.

Local sepsis apparently played little part in the recurring cases. Of the 31 clean cases six recurred; while of the 14 cases in which there was local sepsis, three recurred. Four of the recurrent cases were sutured with chromic catgut, two with kangaroo tendon, and three with non-absorbable suture material. Of the 43 cases in Group II, 14 showed some form of sepsis after operation, one of these cases having phlebitis. In two of the cases there was a large ulcer at the time of operation. The sepsis was in every case of low grade and very mild, but prevented absolute healing by first intention. The wounds healed apparently by primary union, but at the end of from one to two weeks a pocket of serum and "oil" formed under the skin, which necessitated evacuation. Following this the sinus persisted, or closed in a few weeks. In some cases the serum became infected, forming a superficial abscess. In one case several sinuses persisted for three months, at the end of which time a Wassermann was taken, and found positive. Healing occurred promptly after the administration of salvarsan.

PYLORIC EXCLUSION.

LEWISOHN (*Surgery, Gynecology and Obstetrics,* April, 1916) notes that the vast majority of surgeons agree that pyloric exclusion ought to be added to gastrojejunostomy to insure the permanent cure of pyloric and duodenal ulcers. There still exists a great difference of opinion as to the best method of accomplishing this exclusion. Lewisohn considers that the arguments about the permanent anatomical exclusion of the pylorus and about the preference of one method over the other are rather futile. Practically none of the simple exclusive operations will insure per-

manent occlusion. All that is necessary to attain the result of a clinical cure is to prevent food and stomach juice coming in contact with the ulcer for a few months and possibly for a few weeks only. A temporary absolute exclusion of the pylorus, not a permanent one, is needed. This purpose is just as well obtained by the exclusion stitch with a Pagenstecher suture, which seems to be technically the most simple procedure, as by any of the other more complicated methods.

FINAL REPORT OF THE COMMISSION ON VENEREAL DISEASES.

This interesting document is thus commented upon by the *Lancet* of March 11, 1916:

"The Final Report of the Royal Commission appointed in November, 1913, 'to inquire into the prevalence of venereal diseases in the United Kingdom, their effects upon the health of the community, and the means by which those effects can be alleviated or prevented,' was issued last week, with a full knowledge on the part of the Commissioners of the disadvantages of promulgating the report at a time when all public activities are centered upon meeting the manifold needs of the gigantic war in which the nation is engaged. The Commissioners, who were unanimous in signing the main report, were, however, of the opinion that early issue of their views would be advantageous, as the conditions to the investigation of which the appointment of the Commission was due, while existing now, must continue on the conclusion of the war. Their course is one with which all must agree, for those conditions will require remedial action at the earliest opportunity if they are to be dealt with in any practical and comprehensive manner; indeed, we should have welcomed some advice from the Commissioners as to making use now of the instructional opportunities offered by the aggregation in camps of the larger part of our vigorous young manhood. Such an opportunity for giving impressive counsel to crowds who need it will not readily recur. This is not said in any spirit of criticism. For the Report is a document of the first interest to the nation, and it should be read as a whole so as properly to understand the comparative value of the general conclusions and of the evidence upon which they are based. We publish in another column the summary of recommendations and the general conclusions in full, many of which, in their opinion, must have been largely foreseen by the medical profession. That no system of regulation would be favorably mentioned was certain, and that no mode of notification of venereal disease would be recommended was thought probable, as medical opinion is still divided on this point. We think that notification will probably follow on the better instruction of the public in the sequelæ of venereal diseases. The difficulty of determining the real prevalence of these diseases in the country, which it was felt would be experienced by the Commissioners, made it appear likely that some form of confidential registration of causes of death would be suggested as well as arrangements for the compilation of accurate statistics. Perhaps this authoritative report may lead to the reform in our national ways of taking stock by figures, a reform which only last week we suggested was very necessary. In this connection the third recommendation of the Commissioners is exactly to the point.

"The first section of the Report summarizes briefly the previous action taken by the State in this country to control venereal diseases. The story of the Contagious Diseases Acts is set out, and the fact of their repeal thirty years ago is briefly noted, the Commissioners being precluded by the terms of reference from considering the policy of regulation. They seem to have interpreted this limitation as enjoining them not to mention the subject of prostitution, and this gap in their advice to the State will have later to be filled. They place on record, however, their view based on evidence given by experts at home and abroad, that no advantage would accrue from a return to the system instituted under the Contagious Diseases Acts, while they note in support of this the great im-

provement as regards venereal disease in the navy and army which has taken place since the repeal of those Acts. Except in the case of the navy and army there are at present no means of arriving at an accurate estimate of the present prevalence and distribution of venereal diseases. The Commissioners come to the general conclusion, as regards prevalence, that the incidence of both syphilis and gonorrhea is much lower in rural than in urban areas, and as regards the great cities this may be taken as absolutely proven without the least acquiescence in the tentative view that at least 10 per cent of the population of such cities are affected. We find the assumption of so great a prevalence hardly justified in face of the wide-spread belief of the medical profession that the incidence of these diseases in all classes of the population has become definitely lighter. The statistical part of the report is the one which will give the least satisfaction, and many will feel that, apart from certain special inquiries, not much is here set down that is of paramount value. We make exception in favor of the investigations of Dr. Paul Fildes into the prevalence of syphilis among the apparently healthy adult inhabitants of the East End of London; of Sir John Collie into the manifestations of syphilis among 2274 persons referred for medical report by large employers of labor; of the Lister Institute into the occurrence of syphilis among persons admitted to certain asylums; and of Dr. F. W. Mott and Mr. N. Bishop Harman, to which we refer below.

"It is only in comparatively recent years that the full effects of venereal diseases have been recognized, and in the third section of the Report these effects are discussed from the clinical standpoint. The little essay on syphilis thus furnished, describing its early and late results, the danger of spirochætal infection of the walls of the arteries, and the possible production of deadly affections of the brain and spinal cord, makes terrible reading, and reminds us over and over again how much wider our knowledge of the subject has become in recent years. And it is this fact which renders an estimation of the actual prevalence of syphilis particularly difficult, for while it is the wide-spread impression of medical men that the disease is not so rife as it was even twenty years ago, they must recognize as syphilitic phenomena conditions to which wholly different origins were formerly given. Upon gonorrhea the pronouncement of the Commissioners is no less impressive than it is upon syphilis, and in insisting upon the wide-spread mischief which may follow in its train for both sexes, the particularly sad result of sterility in the female is noted in the following comment:

"Gonorrhea is said to be the commonest cause both of absolute and relative sterility in women, probably 50 per cent of all causes. It prevents conception in the early stages by hindering the living germs on which impregnation depends from reaching the uterus, and also by destroying their vitality. Impregnation would therefore appear to be impossible during an acute attack of gonorrhea, and although pregnancy may possibly occur during the subacute stage it not infrequently ends in miscarriage owing to the inflammation from the vagina creeping into the lower zone of the uterus. Should the child be carried to term, the risk of infection of the tubes and ovaries is greatly increased. This leads to such alteration in the structure of these essential organs as to cause the well-known 'one-child fertility.' When complicated by streptococcic and staphylococcic infection gonorrhea may lead to puerperal sepsis and death.

"We agree with the Commissioners that knowledge of these facts should cause both the medical profession and the public to take a far more serious view of gonorrhea than has hitherto been adopted. For this and other reasons we wish for the Report a wide circulation among the public. It will help greatly to obtain universal cooperation in any remedial measures which may be designed to meet the conditions produced by venereal diseases, that the public should be made aware of the influence of syphilis in producing hereditary and congenital disability of a terrible sort. This is illustrated by diagrams contributed

by Dr. Mott on untreated or inadequately treated syphilis, which prove the disastrous results of the infection of a parent. On an adjoining page in the Report will be found a diagram furnished by Mr. Bishop Harman showing the proportions of blindness in children due to venereal diseases, and the lesson is enforced by a statement of the same observer that of 1100 children in London blind schools 31.2 per cent of cases were certainly, and in addition 2.8 per cent were probably, due to syphilis.

"Under the head of the treatment of syphilis, mercurial and arsenical courses are discussed, and the summaries of the reports regarding the drugs used in this country as substitutes for the German products of salvarsan and neosalvarsan show these new substances to be very satisfactory. A part of the evidence to this effect has been already published in our columns, and goes to indicate that kharsivan and galyl are of the greatest possible value. Wisely the Commissioners say, having regard to the fact that in all cases successful treatment must largely depend upon the assistance of the patient, that instructions should be given in the clearest possible manner as to the contagious nature of syphilis, as to the duration of the infection, and as to the necessity for treatment being by a doctor, not by a quack, and being persevered with at medical discretion. For the first time we think the position of the married woman is definitely recognized, as in the report it is suggested that no one who has, or has had, syphilis should marry without medical permission. A similar instruction is recommended in cases of gonorrhea, and the special danger of communicating the disease to the wife is dwelt upon, while the Commissioners recommend that venereal disease should be a ground for nullity of marriage. We agree wholly with this opinion on a sad situation, and also with the statement in the ninth recommendation that institutional treatment for venereal disease should as far as possible be provided at general hospitals. Indeed, we look forward to the day when the general hospitals, in the presence of an enlightened public, will wage systematic war on venereal disease through the medium of highly instructed staffs, both senior and junior. When we all know more, the terrors of venereal disease—real, as they are, beyond description—will be met squarely and dissipated promptly. We read this optimistic forecast into a document of studied moderation."

CHOLECYSTECTOMY.

DEAVER (*Annals of Surgery*, April, 1916) thus describes his technique: With the abdomen open, the gall-bladder and the right free border of the gastrohepatic omentum freed of adhesions (not that there are adhesions in all cases), this region is thoroughly walled off, when with retractors the assistant keeps the wound wide open. The edge of the liver and the fundus of the gall-bladder are grasped with the left hand carrying a piece of moist gauze, pulled downward, outward, and upward, which makes taut the cystic duct and the free border of the gastrohepatic omentum.

When the liver is adherent to the parietal peritoneum to the degree that it would not be wise to attempt severing the adhesions, it will not be possible to dislocate the liver in the above manner. In the presence of a diverticulum (a dilatation of the gall-bladder at its junction with the cystic duct, sometimes called the pelvis), the diverticulum conceals the upper portion of the gastrohepatic omentum and is frequently adherent to it. In either of the above conditions the cystic duct and the free border of the gastrohepatic omentum, between the layers of which lies the duct, are made prominent by grasping either the gall-bladder or the diverticulum with a long pair of curved forceps and making traction.

Where the diverticulum is adherent to the free border of the gastrohepatic omentum, it must be freed before effective traction can be made upon the cystic duct. Unless this be carefully done the common duct may be injured, as occurred in one of the writer's cases. A small incision is made through the upper part of the free border of the gastrohepatic omentum and the cystic duct exposed. The cystic duct

at its junction with the gall-bladder is clamped with a long pair of hemostatic forceps and cut across distal to the forceps with the actual cautery. A small piece of gauze is placed beneath the border of the gastrohepatic omentum to take up the bile that escapes when the cystic duct is divided. A small, followed by a larger, probe is passed into the stump of the open cystic duct and carried through the common duct into the duodenum, in this wise determining whether the duct and the papilla of Vater are patulous. Before the probe is withdrawn from the common duct, the duct is palpated by grasping the descending duodenum and head of the pancreas between the fingers and thumb of the free hand, when it is definitely settled whether the common duct contains a stone or stones. Further, by this means, if the duct contains a stone which is not detected by the probe and yet the probe has passed into the duodenum, through the wall of which the end of the probe can be felt, the stone will be palpated and it can also be determined if there be obstruction outside of the duct. Next, the cystic artery, lying above and to the inner side of the cystic duct, is clamped and cut. In a small percentage of cases the cystic artery lies below and to the outer side of the cystic duct. If it is not necessary to drain the common duct through the stump of the cystic, the cystic duct is ligated and next the cystic artery.

The next step is the separation of the gall-bladder from the liver.

This dissection is made from below upward, the gall-bladder is freed and turned upward and outward, and the gall-bladder bed closed by carrying a continuous catgut suture through the liver substance forming the sides and floor of the gall-bladder bed. The free end of the suture is left long and tied to the portion of the suture the needle carries through the liver substance. The tie is made on the upper side of the line of apposition of the walls of the gall-bladder bed. It will be seen that as the gall-bladder is removed step by step the suture is passed and tied, so that when the gall-bladder is entirely removed the gall-bladder bed is completely closed; by this means the procedure is made a bloodless one. He regards this as far preferable to packing the gall-bladder bed with gauze or placing a cigarette drain therein and retaining it by suture. In a small percentage of cases where the walls of the gall-bladder are not extensively infiltrated, it will suffice to incise the serosa in the long axis of the organ upon either side sufficiently far from where it is attached to the liver to cover the gall-bladder bed when the edges are apposed by a continuous catgut suture. The lateral flaps of the serosa are reflected and the gall-bladder removed from below upward, leaving enough of the fibrous coat so as not to trespass upon the liver. There are a few instances in which a gall-bladder can, to better advantage and with greater safety, be removed from above downward, commencing the dissection at the fundus.

The next step is suturing the divided layers of the gastrohepatic omentum, but not covering in the stump of the cystic duct. The final step is the placing of a small rubber tube down to and just beyond the free border of the gastrohepatic omentum, which is retained for four or five days, so that in the event of the ligature on the cystic duct giving way the bile will have an exit. Occasionally a glass tube is used, when it is replaced the following day by a rubber tube, the latter being small enough to be carried down the glass tube and the glass tube withdrawn. When the gall-bladder is so large that access to the cystic duct is difficult, it may be aspirated or opened and emptied, care being taken to guard against infecting the field of operation, when the removal, as above described, can be made. In some cases of gangrenous and phlegmonous gall-bladders the operation is made a little more difficult than in ordinary cases, yet this technique can be carried out.

Drainage of the common duct by way of the stump of the cyst duct is only a temporary procedure. When, as is frequently the case, it is necessary to have prolonged drainage of the common duct, he opens the common duct and introduces a T-shaped rubber drainage tube. Dr.

Riesman and the author have one patient who is wearing such a tube now going on three years. The author has a number of patients wearing these tubes. This form of drainage is introduced in certain cases of pancreatic lymphangitis, chronic interstitial and interacinar pancreatitis.

Early drainage of the common duct by this method or by a cholecystoduodenostomy is the only chance for the cure of pancreatic diabetes. Metabolic studies will never cure pancreatic diabetes, only the early use of the aseptic scalpel and establishing drainage before infection has caused a serious pancreatic lymphangitis, a forerunner of chronic pancreatitis, and this in turn of pancreatic diabetes.

POSTOPERATIVE TETANUS.

SPEED (*Surgery, Gynecology and Obstetrics,* April, 1916) calls attention to the habitat of the tetanus bacillus and the wide diffusion of its spores. It is noted that about 5 per cent of human beings show tetanus bacilli in their stools, the average varying from 2 to 20 per cent, the higher proportion existing in men who work about horses and stables. It has been shown that enormous doses of tetanus toxin may be introduced into the stomachs of animals without causing death, that these animals do not become immunized, and that their blood serum has not antitoxic properties. It was also determined that ptyalin destroyed the toxin, that gastric juice attenuated it, and that bile and pancreatic juice destroyed it totally. It is evident that the intestinal flora exert a partially destructive action on tetanus toxin, but the mucosa has no influence.

In tetanus infections bacilli have been found in the milk and in the lymphatic nodes, muscles, and nerves. The pathogeny of tetanus infections is a complex phenomenon which must have the simultaneous help of several factors. Pure tetanus spores freed from tetanus toxin of the culture and injected by the millions into the healthy tissues of an animal are harmless. When the spores are deprived of their preëxisting toxin they are devoured by phagocytes, but if some of the same spores in small quantities are injected into the same animal's tissues when the spores are artificially protected against phagocytic action, tetanus is produced. As an example of this requirement a guinea-pig, an animal very susceptible to tetanus, will resist large numbers of toxin-free tetanus spores introduced subcutaneously or intraperitoneally. These animals, however, will succumb to tetanus when but a few spores are injected mixed with unsterile sand or enclosed in a collodion sac. The foreign material with the spores acts as a barrier to the leucocytic action of the host, tetanus toxin is developed, and the animal dies from the absorption of the diffused poison.

For the development of tetanus in man one must have an infection with the specific germ and favorable conditions for its growth in accordance with the requirements described. Simple injuries, superficial and practically aseptic in character, do not favor the growth of tetanus spores. Trauma alone is not a sufficient aid. When tetanus develops in man we must look first for other auxiliary factors in the infected tissue, such as burning, extensive crushing or hematoma formations, all of which may be called traumatic results. Secondly, we must look for associated microörganisms. Necrotized tissue from burns, crushes, and ligated areas, and collections of blood within tissues, favor the growth of tetanus because the usual leucocytic resistance is held at bay.

Tetanus organisms are usually encountered in soils or manure mixed with many other microörganisms, all of which may be expected to enter a soiled wound under equal chances for growth. Some of these added bacteria favor tetanic growth, others do not, a fact easily verified clinically when the enormous number of infections are considered in comparison with the few tetanic developments. In man we must have an inflamed wound with more or less suppuration for the growth of tetanus bacilli. Experiments upon animals have verified these statements. An amount of garden soil infected with tetanus is divided into two portions and moistened. One

part is injected into a guinea-pig; it dies of tetanus. The other part is heated to 80° C., a point which does not destroy tetanus spores, but does other non-sporulating organisms. After injection of the heated soil no local lesion of importance results and no tetanus develops. If later favorable microörganisms are added to heated soil and injections are made of it into susceptible animals, tetanic death results. In practical treatment of wounds antiseptic irrigations and applications may not kill the tetanus organisms, but they do kill or greatly reduce in number associated organisms which assist in tetanic growth, probably by consuming oxygen.

Tetanus in civil practice has become almost eradicated by the prophylactic use of antitoxin and the antiseptic treatment of dirty, contused, and lacerated wounds. Cases of non-traumatic tetanus still persist, especially the unforeseen postoperative cases.

Spontaneous or non-traumatic tetanus must be instituted from either pathologic or physiologic processes, and the usual entrance of the infection is through the outer covering of the body, seldom through the internal organs. Wounds of the navel in the new-born, and postpartum and abortion infections in adults, may be considered as physiologic wounds. Pathologic wounds are found after injections, vaccination, and after operations.

The following forms of non-traumatic tetanus are possible:

Cryptogenetic or rheumatic tetanus, which occurs as a delayed infection after a trauma or an unknown atrium of infection.

Tetanus after skin lesions. These may be very simple and unsuspected as an infection atrium. Kirmisson has reported two cases and Broca one case of fatal tetanus in children from the use of felt pads to compress the spine in the treatment of scoliosis by Abbott's method; small skin excoriations made by pulling the felt pads under the body encasements of plaster became the seat of tetanic development. Organisms were found on the felt. Sterilization of the felt before use is now considered necessary. The skin lesions may be—

In connection with mechanical lesions, such as ulcers of the leg, infected tumors, nasal excoriations, or paraphimosis.

In connection with bacterial skin lesions.

In connection with thermic lesions, as burns or frost-bites.

Tetanus from the respiratory and digestive tracts.

This includes also infections through the ear, a few of which are known. Through a healthy lung the infection is not possible, but in chronic bronchitis, bronchiectasis, or lung-abscess cases have been found. Infection via the tonsils is known. Luckett has recorded a fatal case of tetanus in a child with the point of infection in the cavity of a tooth. Tetanus bacilli were found among other organisms in the tooth, and their character was proved by inoculation experiments. Intestinal infections in tetanus carriers may have been the cause of many of the cryptogenetic or rheumatic cases.

A few cases in connection with typhoid fever, pericecal abscesses, or fecal impactions in the rectum have been recorded.

Tetanus after injections may occur from hypodermic needles, from infection carried in from the skin surface, or from mixtures injected, such as gelatin.

Tetanus after vaccination. Usually from secondary infection by tetanus bacilli, rarely and practically never at this time from the vaccine. McFarland collected 14 postvaccinal tetanic infections, all secondary. Wadsworth, reviewing the cases of tetanus in Philadelphia for the twenty-five years from 1885 to 1909, found twelve postvaccinal cases, nine of which were doubtful as to the origin of the infection and were probably secondary, while three seemed to be primary infections from the vaccination.

Tetanus after operation. In this class the author places tetanic infections occurring after elective operations in cases which are classed as clean from the first. The possible avenues of infection are: The operator's hands; the instruments, dressings, and ligatures; air infection; and the patient himself. This last source has been considered remote, and Matas was the first to call serious attention to it. A large majority of the reported postoperative cases

in the preaseptic and early aseptic era were connected with operations in the female pelvis.

Wilms in the ten years from 1868 to 1879 found five cases after herniotomy. Because postoperative tetanus has not disappeared from aseptic surgery operators have been forced to seek a cause for the infection on which to lay the blame. Naturally animal ligatures—catgut—have become the cynosure. Two points in that connection are worthy of attention. In the early days of catgut use for buried suture and ligature, very little was ever said or noted concerning tetanic infection from it. In the first decade of this century, in spite of the enormous amount of catgut used there are only some sixty cases of tetanic infection which are even remotely attributed to its use.

In surgery, operations other than laparotomy occur twice as often as opening the abdomen, and more ligatures are used in them, but in 19 of the 21 cases collected by Richardson the operation was a laparotomy, and handling or suturing of the bowel was performed. Richardson cited the experience of one operator who on a certain morning performed five laparotomies, using the same preparation of catgut. Patients number 3 and 4 in this series, a gall-stone case and an appendectomy respectively, developed tetanus, but the other cases did not.

In 1909 Matas called attention to the risk of tetanus infection in operations on sterile tissues in which postoperative asepsis cannot be assured. Operations on those parts of the body exposed to fecal contamination are the doubtful ones because of infection derived from fecal discharge. The genitourinary organs of both sexes, the anorectal regions, the sacrococcygeal region, and the inner surfaces of the thigh or legs, or any other part of the body which might be contaminated, lie in this class. After two personal cases Matas advised abstinence by the patient for several days prior to operation from such foods as might carry tetanus. Raw vegetables and other food, as lettuce, celery, cabbage, watercress, radishes, tomatoes, etc., and raw fruits, as strawberries, blackberries, etc., must be removed from the diet and a free catharsis instituted for three or four days previous to operations on the areas named previously.

Atkinson in 1915 reported a case of postoperative tetanus following removal of hemorrhoids, and found that there were but six other cases.

In view of the various experimental and bacteriological data mentioned in the biologic considerations, it seems possible that some human beings carry and excrete tetanus organisms for long periods and are really tetanus carriers. Their greatest danger is to themselves, because after operative procedures which permit fecal contamination of the wound tetanus may be inaugurated. This is particularly true of abdominal operations where the gut is bruised or roughly handled, and opportunity for tetanus development ensues in accordance with the pathologic requirements. The possibility of hematogenous infection must also be weighed. Considering the great number of anorectal, gynecologic, and intestinal operations and the few postoperative cases of tetanus resulting therefrom, it seems that we may attribute those few which are exceptionally occurring in spite of preoperative preparation to tetanus carriers.

RENORENAL REFLEX PAIN.

In a discussion of this subject H. A. FOWLER (*Surgery, Gynecology and Obstetrics,* April, 1916) concludes that the symptom of pain arising from disease in one kidney may be referred entirely and completely to the opposite side, the latter organ being healthy so far as they were able to ascertain by present methods of examination. In the absence of any demonstrable lesion either within or outside of the kidney sufficient to account for such localization of symptoms, we are justified in assuming the pain to be reflex—renorenal reflex pain.

Cases of renorenal reflex pain are rare. Only a relatively small number have been reported in detail.

The importance of this phenomenon, from the standpoint of diagnosis, is not as great as it once was. Errors in diagnosis

are not so apt to occur from misleading subjective symptoms since the employment of more accurate means of examination—*x*-ray, cystoscopy, ureter catheterization, and renal functional tests—has become more general. The occurrence of this phenomenon, however, emphasizes the importance of a thorough and complete preoperative examination of every case of suspected renal calculus.

REVIEWS.

PLAGUE. Its Cause and the Manner of its Extension, its Menace, its Control and Suppression, its Diagnosis and Treatment. By Thomas Wright Jackson, M.D. With Bacterial Observations, by Dr. Otto Schöbel. Illustrated. J. B. Lippincott Company, Philadelphia, 1916.

The constant presence of plague among lower animals on the Pacific Coast for a number of years makes it needful that American physicians shall have clear conceptions in regard to this disease, the more so because of its extraordinary prevalence and mortality in other parts of the world. Dr. Jackson has had ample opportunity, by virtue of tropical service, to study the disease in person and also to come in contact with other medical men who have had large experience in its control, both as an epidemic and in the individual. Having been at one time a lecturer upon Tropical Medicine in the Jefferson College he knows how to present his facts in an interesting and educational form. Altogether he divides his theme into four chapters. In the introductory remarks he discusses the history of plague and its method of extension, and points out that during recent years it has been present in Porto Rico, New Orleans, and Manila. He then discusses its bacteriology, and after this considers its control, and then discusses the importance of the extermination of rats and other rodents. The last chapter deals with the necessity of having the diagnosis made by a trained bacteriologist, gives the necessary bacteriological procedures, describes the symptoms which lead clinically to the diagnosis of plague, and, finally, deals with the use of serum as a protective agent and with the use of plague vaccine.

Incidentally, it will interest our readers to know the efficiency of various methods of catching rats. Thus, the author states that in three months there were 120,565 spring or snap traps set, and that for every 100 traps there were caught 6.9 rats. During the same period there were 47,075 wire cage traps set, but the total number of rats was 339, which gives 0.72 caught for each trap set, indicating that the spring trap is infinitely preferable to the cage trap. It was also found that traps were infinitely preferable to poisoned food as a means of destroying these rodents. Notwithstanding the cheapness of poison methods as opposed to trap methods, in the long run the trap is the more economical method of the two.

As illustrative of what an active antirat campaign can accomplish it is interesting to note that from July 1, 1912, until June 30, 1913, the total catch in the city of Manila was 55,101, and that in the remaining six months of 1913 the total was 79,676 rats. The author very properly believes that this campaign distinctly checked the spread of plague in Manila in 1913 and that the antirat campaign should be persistently maintained.

RULES FROM RECOVERY OF TUBERCULOSIS. A Layman's Handbook of Treatment. By Lawrason Brown, M.D. Second Edition, Thoroughly Revised. Lea & Febiger, Philadelphia, 1916. Price $1.25.

We have often pointed out that the physician who attempts to write for the laity sets himself a difficult task. On one hand, it is by no means easy to present medical facts in language which is not technical, and, on the other hand, it is all too easy to give false impressions by reason of the avoidance of medical terms which have a very definite meaning. Dr. Brown has been peculiarly fortunate in his effort and presents for the perusal of those who are ill

with tuberculosis, or of those who are taking care of tuberculous patients, text which may be honestly said to be sane and safe.

His chief object, he tells us, has been to help patients avoid blunders, and the text was written primarily for his own patients. He has attempted to make clear the whys and wherefores of many rules ordinarily given to patients, for he believes that the day has come when the physician shall look upon his patient not as an ignorant child but as a human being endowed with more or less intelligence.

There are twenty-five chapters in this little book of 184 pages discussing Rest, Food, The Use of Alcohol and Tobacco, Living Outdoors, The Temperature of the Body, The Weight, and the General Hygienic Care of the Patient.

We are interested to note that in the chapter devoted to Alcohol and Tobacco, the author takes the view that alcohol has little value in the treatment of tuberculosis, although he admits that it is used more largely in private sanatoria in Europe at the present time than in this country. Of course, the whole problem of the use of alcohol in these cases must be decided on the individual case, as to his constitution and as to his disease. In discussing the influence of tobacco in tuberculosis, the author well says that as a matter of fact tobacco injures fewer men than does excess in eating. The position which he takes is that cigarettes irritate the throat, that moderate smoking for a healthy adult exerts little harm, and the fact that it soothes and quiets some men cannot be denied.

So much has been said in regard to the use of tuberculin in the treatment of tuberculosis that we look with interest at Chapter 20, in which the author discusses this important subject. We rather admire his temerity in dealing with a matter for the laity about which there is so much difference of opinion amongst medical men. The chapter, however, covers only two pages. He states very sensibly that just how tuberculin acts is not fully understood. In an all too small number of patients the results from its use have been remarkable; that another small group cannot tolerate it at all; and that the vast majority of patients take it well, although they experience comparatively little benefit from its use. All of these statements are based, however, upon the tuberculin being administered by some one who is skilled in its use and to a patient who is under absolute control and prepared for hourly observation if necessary.

THE INTERNATIONAL MEDICAL ANNUAL. William Wood & Co., New York, 1916. Price $4.00.

For many years we have reviewed each issue of the International Medical Annual, which is published simultaneously in Great Britain and the United States. As in the past there are many contributors from Great Britain and few from this country. This is eminently proper in view of the fact that the Annual originates on the other side of the water.

It opens with a Review of Therapeutic Progress for 1915, followed by a Dictionary of Remedies, and then a discussion of Radioactivity and Electrotherapeutics, with Surgical Progress, Blood Examinations, Cerebrospinal Fever, Syphilis, Typhoid Fever, and Mental Diseases. At the foot of each article the chief reference to the matter considered is given. There are quite a number of colored plates, which are well executed, most of them being from microscopic preparations. There are also a large number of black-and-white drawings and black-and-white plates. The International Medical Annual of 1916 fully maintains the excellent characteristics of preceding volumes.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., Assisted by L. F. Appleman, M.D. Volume 2. June, 1916. Lea & Febiger, Philadelphia, 1916.

The June issue of Progressive Medicine contains, as in previous years, a summarization of Hernia by Dr. William B. Coley, of New York; The Surgery of the Abdomen, Exclusive of Hernia, by Dr. John C. A. Gerster, of New York; Gynecology, by Dr. John G. Clark, of Philadelphia; Dis-

eases of the Blood, Diathetic and Metabolic Diseases, Diseases of the Thyroid Gland, Spleen, Nutrition and the Lymphatic System, by Dr. Alfred Stengel, of Philadelphia; and Ophthalmology, by Dr. Edward Jackson, of Denver.

The volume is copiously illustrated, and the authors have adhered to the primary plan devised at the first publication of this quarterly, namely, that in the discussion of contributions made during the past twelve months, they express their own views and utter criticisms of other writers whenever these criticisms will add to the interest and value of the text.

GYNECOLOGY. By William P. Graves, M.D., F.A.C.S. Illustrated. W. B. Saunders Company, Philadelphia and London, 1916. Cloth $7 net; half-morocco $8.50 net.

The author having designed his work as both a text-book and a general reference book of Gynecology has adopted a special classification devoting the first part to the Physiology of the Pelvic Organs and the Relationship of Gynecology to the General Organism.

The second part is designed primarily for the undergraduate student who is taking an initial course in Gynecology. It includes a description of those diseases which are essentially gynecologic.

The third part is devoted exclusively to the technique of gynecological surgery, and is written for the assistance of the advanced student and practitioner.

Of particular interest is a small subsection entitled Relationship of Gynecology to the Organs of Internal Secretion, a truly admirable summary of the little that is really known concerning these glands and their correlation.

Considering the question of castration, the author states that no specific psychic or neurotic reaction follows castration in the adult, if properly performed. He admits that various vasomotor phenomena may develop, which are relieved by ovarian extract.

A brief but very satisfactory discussion of organotherapy is given. The relationship of Gynecology to the Skin, the Special Senses, the Stomach, the Organs of Respiration, the Blood, the Organs of Circulation, and the Nervous System are taken up both in detail and with a refreshing spirit of broad philosophy.

Part II begins with Gonorrhea, continues with Tuberculosis, and thereafter takes up General Inflammatory Processes and New Growths and Effects of Development, Malpositions and Injuries due to Childbirth. Thereafter follow special gynecological diseases, including under these Ectopic Pregnancy, Membranous Dysmenorrhea, Sterility, and Uterine Insufficiency. Finally there follows a small section on General Symptomatology and Gynecology. The last section, excellently illustrated in Bröedel's style, though not by him, includes a brief, clear, and satisfactory description of the usual gynecological operations. In this section are Operations on the Abdominal Wall, including that for the repair of umbilical hernia. Finally there is a brief section on Operations on the Kidneys, Ureters, and Rectum.

It is a text-book in the fullest sense of the term, with a strong personal touch, and worthy of high praise.

INTERNATIONAL CLINICS. Volume III, 25th Series. Edited by Henry W. Cattell, A.M., M.D. J. B. Lippincott Company, Philadelphia and London, 1915.

This always interesting and instructive volume contains many serviceable articles, among others a short treatise on Gonorrhea and its Complications and Sequelæ. A large subject, which the author has covered to his apparent satisfaction in 34 pages, concluding with the remark: "If treatment is followed as outlined here the short duration of the attack and absence of complications will be particularly gratifying to both the surgeon and the patient."

Among other aphorisms the author states that "local anesthesia must never be used in the urethra while passing sounds since it frequently masks symptoms."

As to office technique, "the patient is requested to remove his clothing, and a sterile suit of pajamas is put on. The trousers of the suit are slit from waist

behind to waistband in front, so that the genitals may be readily exposed for examination."

It is stated that when acute posterior urethritis is already evident strenuous treatment of the posterior urethra must follow. If the patient presents himself with an epididymitis local treatment of the anterior urethra should begin at once. The author's secret of success lies in frequent repetition of injections of nargol.

There is an excellent paper upon "The Educational Treatment of Ataxia," by Morris Grossman, and an interesting paper upon "Therapeutic Technic," by William Brady, in which aloes is called, with perhaps unconscious humor, "a pile-driving physic."

Newlin writes briefly upon "Some Unusual Cases of Abdominal Pain." There are some case reports not without interest. Some War Experiences in Germany and France by Rahm. A clinical and very excellent study of the Malingerer by Glueck.

Roberts's contribution on "The Treatment of Fracture of the Lower End of the Radius by Reduction and Contour Splints" is thoroughly rational. Altogether the book contains much that is instructive and entertaining.

BONE-GRAFT SURGERY. By Fred H. Albee, A.B., M.D., F.A.C.S. Illustrated. W. B. Saunders Company, Philadelphia and London, 1915. Cloth $6 net; half-morocco $7.50 net.

This work deals with the direct accurate implantation of autogenous bone-graft contacting corresponding structures of graft and host bone—*i.e.*, periosteum to periosteum, compact bone to compact bone, endosteum to endosteum, and marrow to marrow. Moreover, it is an extremely satisfactory description of the author's technique. In this respect it differs widely from the usual text-book, nor is there evidence of any but a sincere desire to help those who believe in the methods described and wish to practice them.

The first chapter is devoted to the fundamental principles underlying the use of bone-graft in surgery. Thereafter is described the author's motor and technique of its use. Thereafter follow The Bone Graft in the Treatment of Pott's Disease and Other Lesions of the Spine; The Inlay Bone Graft in the Operative Treatment of Fractures; Operative Methods for Remodeling or Ankylosing the Hip-joint; The Use of the Graft; Fixation of Tuberculous Knee-joints; Infantile Paralysis; Osteoarthropathy; Bone-graft and Disease and Deformities of the Foot and Leg; and Miscellaneous Surgical Uses of the Bone-graft.

Actuated as it is by belief and enthusiasm and standardizing a branch of surgery little understood and less practiced, this book is of great value to the active surgeon.

EMBRYOLOGY, ANATOMY, AND DISEASES OF THE UMBILICUS, TOGETHER WITH DISEASES OF THE URACHUS. By Thomas Stephen Cullen. Illustrated by Max Bröedel. W. B. Saunders Company, Philadelphia and London, 1916.

Few people can read the title of this work without experiencing a distinct sense of amazement. Still fewer can close the book, printed in Saunder's best style, illustrated with Bröedel's maximum skill, and exhibiting to an astonishing degree a patient and honest research, without a distinct sense of admiration for its author and of indebtedness to him in that he has shown how profitable detailed study can be made.

There are 268 plates and 269 illustrations. The first chapter is devoted to the embryology of the umbilical region with Bröedel's descriptive pictures, which are of extraordinary merit. Thereafter follows a section upon the Anatomy of the Umbilical Region, with four plates containing sixty accurately drawn pictures of various umbilical types. Thereafter follow sections upon Umbilical Infection in the New-born; Umbilical Hemorrhage; Remnants of the Omphalo-Mesenteric Duct and Meckel's Diverticulum; Intestinal Cysts; Patent Omphalo-Mesenteric Duct, and its Complications; Cysts in the Abdominal Wall due to Remnants and Umbilical Concretions; Escape of Fluid Fæces; Parasites and other Foreign Substances from the Umbilicus; Umbilical Tumors; Umbilical Hernia; Patent Cystic Formation and Infection of the

Urachus; Acquired Urinary Fistula of the Umbilicus; and Malignant Changes in the Urachus.

This is of its kind a model work, scholarly, comprehensive, practical, and most serviceable to the practitioners of both medicine and surgery.

LOCAL AND REGIONAL ANESTHESIA. By Carroll W. Allen, M.D. W. B. Saunders Company, Philadelphia and London, 1914. Cloth $6 net; half-morocco $7.50 net.

This book, dedicated to Dr. Rudolph Matas, who contributes an excellent introduction to it, presents an enormous amount of scholarly research and a comprehensive presentation of the subject.

Beginning with the history of local anesthesia, there follow chapters upon Nerves and Their Sensations; Osmosis and Diffusion; The Anesthetic Effects of Pressure-Anemia; Local Anesthetics.

Novocaine hydrochlorate is recommended as the safest and most satisfactory anesthetic yet introduced. Toxicity is discussed at length. After a consideration of the general principles of technique and the indications and contraindications in shock and anociassociation, the methods of inducing local anesthesia are considered. Sections are devoted to methods applicable to the upper and lower extremities and the neck, the abdomen, and other regions of the body.

The directions given are sufficiently explicit to enable the skilful injector to perform practically any operation under local anesthesia.

Since this form of anesthesia will ultimately supplement all others in the great majority of surgical operations it behooves the alert surgeon to keep himself in thorough touch with its latest advances. Therefore Allen's book is likely to be serviceable to him.

SURGICAL OPERATIONS WITH LOCAL ANESTHESIA. By Arthur E. Hertzler, A.M., M.D., Ph.D., F.A.C.S. Second Edition. Surgery Publishing Company, New York, 1916. Price $3.

The fact that a second edition of this book is called for itself attests to the merits of the work. The author has enlarged the scope of his original book, but has not departed from his original plan of giving methods of procedure in minute detail. A chapter is devoted to the drugs which are used. In this chapter novocaine seems to be given first place, unfortunately so at this juncture, since the drug is difficult to get. Quinine and urea are warmly commended. The technique of injection is given in satisfactory detail. Thereafter follow directions for individual operations, the opening of abscesses, and abdominal procedures.

The infiltration method is the one of choice. Both the novice and he who believes in local methods and practices them will find much help in this work.

ORTHOPEDIC SURGERY. By Edward H. Bradford, M.D., and Robert W. Lovett, M.D. Fifth Edition, Illustrated. William Wood & Company, New York, 1915. Price $3.75 net.

The fifth edition of Bradford and Lovett's Orthopedic Surgery follows the lines of its predecessors. The first chapters are devoted to Tuberculous Diseases of the Bones and Joints. There is a chapter devoted to Arthritis Deformans. The treatment advised is essentially rational. Operative treatment is strongly advised for recurring displacement of the semilunar cartilage. The Surgery of Palsies is gone into very thoroughly. Talipes and other deformities of the feet are somewhat briefly considered. The call for edition after edition sufficiently attests the value of this work. It represents the direct teaching of men of ripe judgment and wide experience. Its pronouncements may be regarded as authoritative.

A TEXT-BOOK OF FRACTURES AND DISLOCATIONS. By Kellogg Speed, S.B., M.D., F.A.C.S. Illustrated. Lea & Febiger, Philadelphia and New York, 1916.

Considering the existence of such excellent text-books as those of Scudder, Cotton, and Stimson, there would seem no large need for a new text-book on the subject of fractures and dislocations, nor does a superficial inspection of this volume suggest that literature has been particularly enriched by

what is undoubtedly a painstaking and conscientious effort, but one evidencing neither clarity of vision nor vigor and directness of diction.

Under the subheading of Cosmetic and Functional Results the author states that "malunions, shortened legs, useless elbows or arms, angular deformities, are sources of embarrassment, and also, through causing a restriction of activity in a person otherwise healthy, are worth considering when manipulative treatment without open operation has left the conditions."

The illustrations are particularly good, the classifications at times confusing. The specific directions lack in that minute accuracy which makes them entirely serviceable and practicable. None the less a more careful perusal of the book shows much that is helpful to the surgeon who deals with this class of injuries.

PRACTICAL CYSTOSCOPY. By Paul M. Pilcher, A.M., M.D. Second Edition. W. B. Saunders Company, Philadelphia and London, 1915.

The second edition of this admirable book comes as a welcome guest to the workers in this department of surgery, since in addition to the accepted facts it contains all that is new and proven to be worth while. It is perfectly clear and specific in its descriptions of technique. The illustrations are admirable. The section on the Use of the High Frequency Current in Lesions of the Bladder is particularly serviceable at this juncture. It is a book thoroughly to be commended.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

The Compulsory Service Act now before the House of Lords has not yet become law, but there is every prospect that it will receive the royal assent within the next few days. The medical profession will in the ordinary course of events be called up in exactly the same degree as any other profession, and it might be thought that the labors of the medical War Emergency Committee would be wasted by reason of this new act. Prior to this act it was understood that the scheme for enrolling medical men would be abandoned, unless a certain percentage of the medical profession enrolled. It was not announced what that percentage should be—surmises of about 70 per cent were stated—nor whether the requisite numbers were obtained. Obviously in view of compulsory service the matter becomes of no importance. A large amount of information as regards the medical requirements in various districts will have been obtained by this Committee, and no doubt this information will be placed at the disposal of the War Office, who may decide to act in accordance with the ideas set by the promoters of the scheme. Should medical men be called up on any other principle than the needs of the districts in which they reside, there will undoubtedly be severe shortage, for even now the medical profession is being worked very hard. It is generally believed that about 12,000 medical men are with the army, out of a total of about 30,000, and that a further 2000 may be required. This is taking nearly half the total number of the profession, while leaving nine-tenths of the population to be looked after by the remainder. Most people will agree that the medical profession is in ordinary times probably the most hard-worked body of men in the country, and the extra work which is likely to be imposed on those who stay behind may have serious consequences on their health and work. Fortunately no epidemic of any seriousness has arisen. There certainly has been rather more measles and German measles, and there is at the present time an increase in the cases of whooping-cough, but epidemics of serious nature and requiring close medical attention have not occurred during the past winter.

The necessity for producing more medical men for the Royal Army Medical Corps has led the government to take two steps which evoke criticism. For the last few years medical inspection of children by the school board medical officers has developed to a large extent. It is now proposed to remove these medical officers from their posts and transfer them to the R. A. M. C., the suggestion being that their positions would be temporarily occupied by older men or by women doctors. Providing the war does not go on for a long period, it would seem justifiable to dispense with this branch of the medical work. The children at the present time are thoroughly well inspected, and very little harm would result from lack of inspection for a period, say, of eighteen months. As a matter of fact, a large number of these posts are already held by women doctors, so that the regulation would not cause so much trouble as would at first sight appear. The second step taken is that the work of medical officers in connection with factories will be reduced, in that reports of accidents will be considerably abridged. This step has naturally met with a large amount of criticism, especially from the factory surgeons, but again this change should not be of vital importance to the community.

Dealing with medical work arising from the war, there is not a great deal to report. There is still a considerable influx of cases classified as shell shock, and of those coming under the heading of irritable hearts. There is much discussion as to the pathology of these conditions. The main views may be grouped as follows: First, that the condition is due to some preceding carditis; second, that it is a nervous phenomenon resulting from lack of vascular tone, which in itself may be associated with thyroid inefficiency; third, that it is due to some unknown toxemia, the cause of which is to be discovered; fourth, that it is due to some intestinal condition due to infection by a hitherto unknown organism. Looking at the condition broadly, it appears to be an accentuation of a similar state of affairs not infrequently found in practice apart from war-time, but no doubt accentuated by the extra strain. It will be noted that any of the theories advanced may be themselves dependent upon some toxic condition, which is not necessarily due to the results of military service. A number of these cases are being investigated at Mount Vernon Hospital under the auspices of the Medical Research Committee, which has taken over this institution. Formerly the hospital was devoted to the treatment of tuberculosis and other pulmonary conditions, but about three years ago was closed, and it was owing to this closure that the hospital has been acquired for the purposes of research. Prior to the war it was intended that the research should deal with all conditions in connection with tuberculosis, and no doubt research in this direction will be continued in the future.

Last Sunday and during the preceding afternoon the clocks were all put forward one hour, except those which by error were put back a similar time. It is quite remarkable what a small amount of grumbling or complaint has been voiced as a result of the change, the suggestion of which formerly produced so much opposition. Up to the present there seems to be very little perceptible alteration, except that we can eat our dinner and read the evening paper afterward in daylight instead of artificial light. So far the change seems all to the good in town. Later on there may be some difficulty in the country, as it is not supposed that the dew is likely to clear off the grass an hour earlier than the usual time to oblige the clock. This may have a tendency to cut the day's work in the grass and corn harvest one hour shorter than usual. This difficulty should be quite easily overcome with a little arrangement. Putting on of the clock one hour reminds me of an incident which occurred some years ago when I was a student at King's College. On the 31st of March some of the students got out on the roof over an archway onto the top of Somerset House, and with great effort pulled down the minute hand of the clock until it was advanced 15 minutes. Next morning it was quite in-

teresting to see the clerks coming in at the gate finding they were a quarter of an hour later than usual, hurrying across the court and entering their names as quickly as possible. Pulling down the minute hand of a large clock requires a good deal of effort.

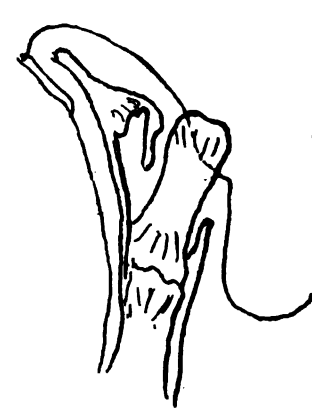
Another change which has been brought in is not meeting with such favorable reception. Owing to lack of labor there is a tendency on the part of the authorities not to water the roads and streets as much as is usually done at this time of the year. The fear has been expressed that the result of increased dust will be to provoke a larger epidemic of infantile diarrhea than has occurred in the past few years. These epidemics have in the past been largely attributed to this cause. Against this theory has been placed the fact that attacks have occurred in houses where the milk has been taken in the morning and sterilized. In a certain number of cases I found that, though sterilized, the milk had been kept in an uncovered jug, and was therefore liable to a fresh infection. Directions are now given to obviate this condition, and where carried out properly the attacks have ceased or not occurred. Amongst the many diseases which have been attributed to street and road dust is anterior poliomyelitis. These suggestions have been put forward by several men who were investigating the epidemics which occurred in various parts of the country, Devonshire suffering rather severely about three years ago. We must therefore hope that this innovation will be cancelled, and the regulations as to watering the streets be enforced as formerly.

COMPOUND DISLOCATION OF THE PHALANGES.

Editors of the THERAPEUTIC GAZETTE.

SIRS: I wish to report a case in which the distal end of the metacarpal bone of the thumb was thrust through the thenar eminence, projecting nearly an inch from the skin, appearing as clean and shining as a new billiard ball, excepting for some adherent coal dust, which was washed off with water. The bone was replaced and the wound was dressed with boric acid powder, which with the few drops of blood exuding perfectly sealed the wound. The dressing was removed by the patient in two or three days. Late examination showed good motion and trifling enlargement of the joint.

A second case of some interest was observed in 1895. The rough drawing illustrates the nature of the injury, the end of the second phalanx protruding through the skin, the extremity of the distal portion of the torn flexor tendon not showing. The attending surgeon had some difficulty in replacing the distal phalanx, that part of the flexor tendon attached to the base of



the bone being dragged between its articulation and that of the proximal phalanx by efforts at reduction. The extensor tendon promptly pulled the bone out of place as soon as holding pressure was removed. Small forceps were introduced through the torn skin, and these grasped the piece of flexor tendon attached to the first phalanx, pulling it from between the bones and out through the skin wound. The distal phalanx was then easily replaced, requiring no force to hold it in position. The end of the flexor tendon was replaced in its sheath, but was not stitched. When the bandage was removed there was some enlargement of the joint and difficulty in picking up small objects, but later there was nearly normal movement of the first phalanx. Even at this reporting there was still slight enlargement at the joint, but movement is good, flexion almost normal.

ARTHUR A. RADCLIFFE, M.D.

WAUKEGAN, ILL.

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ORIGINAL COMMUNICATIONS.

HYPOTHYROIDISM, WITH REPORT OF CASES.[1]

BY HARVEY G. BECK, Sc.D., M.D.,

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Clinically the quantitative secretory disturbances of the thyroid gland are divided into the two groups of hyperthyroidism and hypothyroidism. The qualitative secretory disturbances are embraced in a third group which is designated dysthyroidism. The term hypohyperthyroidism has also been used in describing a certain type of cases with mixed symptoms.

The series of cases reported here belong mainly to the general group of hypothyroidism.

Complete loss of the function of the thyroid (myxedema) is a comparatively rare disease, but a relative deficiency which necessarily must vary in its clinical manifestations from the very typical picture of true myxedema to the slightest deviation from normal health according to the degree of diminution of secretion is quite common. Moreover, it is perfectly rational to assume, reasoning on the physiological basis of a quantitative functional disturbance, that the milder the type the more commonly they occur. Besides the influence of the thyroid secretions quantitatively on the general health of the individual, there unquestionably occurs a qualitative secretory disturbance in which the composition itself is altered, the symptomatology of which is at the present not well understood. When we know more about this phase of the thyreopathies we may be able to diagnose more rationally cases of so-called functional neurosis, psychomotor-neurosis, psychothenia, neurasthenia, etc. It may thus be appreciated why these conditions are so easily overlooked. When I was asked to report my cases at this meeting a special request was made to emphasize the symptoms which led me to suspect hypothyroidism, and in order to bring out the points I have tabulated the symptoms.

1. *The Relation to Acute and Chronic Infectious Diseases.*—It has been stated that the thyroid possesses very energetic antitoxic properties, and when its function is lost, as in myxedema, the individual readily acquires infectious diseases. This has been demonstrated experimentally on animals. However, in studying the relation of thyroid deficiencies in my series of cases with infectious diseases the results would suggest the contrary. In eight of the cases the symptoms either followed or became aggravated after operations for various chronic infections. These included operations on the appendix, gall-bladder, ovaries, tonsils, etc. In nine cases chronic infections either coexisted or antedated the onset of myxedematous symptoms, while in two cases the patients showed definite symptoms of hyperthyroidism before the operation for these chronic infectious processes. In fact, the removal of chronically inflamed tonsils, appendices, and gall-bladders has been recommended as the first step in the treatment of Graves's disease.

[1] Read at the semi-annual meeting of the Medical and Chirurgical Faculty of Maryland, and in abstract at the Duval County Medical Society, Jacksonville, Fla.

Improvement has frequently been noticed following such operations. Rosenow's recent investigation of chronic infections by means of his improved cultural methods seems to demonstrate that the disturbance of the function of the thyroid in a large majority of cases is secondary to the infection of the gland itself. He has been able to almost invariably isolate organisms from glands removed by operation. The earliest English authorities recognize that complete myxedema most frequently appears after previous infectious diseases.

2. *The Relation of the Symptoms to Diseases of the Organs of Reproduction.*—Inter-relation between the secretions of the thyroid and the ovarian secretions is well emphasized in this series. In ten of the fifteen female patients a definite history of some functional disturbance or organic disease of the pelvic organs was obtained. In the other five cases no record was made in reference to these organs. Included under this head are the following conditions: amenorrhea, ovarian and tubal disease with operation, uterine fibroid, atrophied ovaries, infantile uterus, small uterus, dysmenorrhea, repeated dilatation in two cases, abortion with chronic endometritis, and luetic infection with premature birth, sterility, and anaphrodisia. More than half of the cases suffered with vesical irritability.

3. *The Effect on Temperature and Circulation.*—In nine of the sixteen cases the temperature was subnormal, varying from one-half to one degree or more. Two of the patients ran a normal temperature, and in five no record was obtained. In fifty per cent of the cases the pulse was below normal, ranging from 56 to 70. Excluding two cases, the blood-pressure was uniformly low, possibly averaging 105. There were several instances in which the pressure was below 90. One showed a pressure of 155, and another 130. Functional systolic murmurs at the base were frequently observed. The predominant features in two of the cases were symptoms associated with peculiar heart attacks. In one of them, a case of true myxedema, this heart syndrome so masked the real condition that several of the ablest clinicians failed to make a correct diagnosis.

4. *Gastrointestinal Symptoms.*—Gastric analysis was made in eleven cases. Hyperacidity was present in four, subacidity in three, and four were normal. Constipation usually associated with catarrhal colitis is the rule. One patient suffered with diarrhea and one with vomiting.

5. *Influence of Weight.*—Twelve of the cases gave a history of more or less rapid gain in weight, which coincided with the progress of the clinical course of the disease. With the gain in weight there appeared to be a diminution in the amount of food taken owing to loss of appetite. The four heaviest patients weighed respectively 220, 233, 244, and 280 pounds. The first one was a girl who considered her weight at thirteen years of age about the average for that age. At sixteen she weighed 220 pounds. The second patient weighed 115 pounds when she was twenty-five; at thirty-seven she weighed 233 pounds. The third was a typical case of myxedema. Her weight increased while actively engaged at work—nursing—from 180 to 244 pounds. The fourth patient gained weight rapidly until she reached 280 pounds. The weight in three of the cases remained stationary, and one patient had lost six pounds.

6. *Trophic Disturbance.*—Changes in the nutrition of the hair, nails, and skin occurred in practically all of the cases. In several of the doubtful or so-called mixed cases the changes were not uniform—*i.e.*, the hair escaped in some cases, the nails in others, and again the texture and moisture of the skin remained normal in several cases. Swelling of the feet and legs occurred in six cases, one of which was associated with general edema and showed pitting on pressure; another case also showed pitting.

7. *Respiratory Symptoms.*—Dyspnea is almost invariably a symptom, especially on exertion. Severe paroxysmal cough was

the chief complaint of one of these patients. Asthma was not present in any of this series, although Osborne reported several cases in which this symptom was the main feature.

8. *Mental Symptoms.*—Dulness, apathy, and stupor are very characteristic symptoms. They occur in all cases, definitely classified as hypothyroidism, with varying intensity, from a very mild to an intense degree. The memory was impaired in nearly all the cases. Fears and obsessions were not common, but they were symptoms in two cases during a period of hyperthyrea through which these patients passed. Hallucinations occurred in three cases. Two were of the type described by Murray in 1901 as quite characteristic of hypothyroidism. They were hallucinations of sight, in which the patients saw small animals, usually mice, running on the floor. The other patient in her hallucinations saw a man in the ward, to which she called other patients' attention, and she also had an illusion during which she saw two men climb up a ladder on a chimney. What she really saw was the smoke from the chimney.

9. *Relation to Other Organs of Internal Secretion.*—Attention has already been called to the relation of hypothyroidism to the ovarian function. Unquestionably in a number of the cases there was evidence of ovarian deficiency, expressed by such symptoms as amenorrhea, sterility, and anaphrodisia. In two of the cases this diagnosis was confirmed by therapeutic test of the administration of corpus luteum, which augmented the effects of thyroid and relieved the symptoms of amenorrhea in which thyroid alone had failed. One of the cases was apparently associated with hypopituitarism. This patient presented the picture of adiposis dolorosa in the manner and distribution of fat, although she lacked the hyperesthesia which usually attends this condition.

Disturbance of the pancreatic function occurred in one patient who had intermittent attacks of glycosuria. The sugar disappeared as her general condition improved on the administration of thyroid.

CASE 1.—*Typical of the average case, except for impairment of the glycogenic function.* Female, aged thirty-seven. Patient has had typhoid fever and appendicitis, and frequent attacks of tonsillitis. For the past two years she has suffered from constipation, with mucus in the stools and frequent attacks of headaches and vomiting. She had an intermittent glycosuria. Her weight increased from 115 pounds, twelve years ago, to 233 pounds. Eight years ago menstrual disturbances appeared. Her periods became irregular and scant, and finally amenorrhea developed, lasting from six months to a year. She had one pregnancy, which terminated in a miscarriage.

There was a gradual change in her disposition. She became mentally dull and despondent, with impairment of memory, and she became physically sluggish and languid. Her hair was dry, brittle, and falling out, the skin harsh and dry, and the nails brittle. These symptoms all improved upon the administration of thyroid.

CASE 2.—*Complete athyrea with an outspoken symptom-complex of myxedema.* Female, aged 39. She had had the following infectious diseases: mumps, measles, whooping-cough, pneumonia, and repeated attacks of tonsillitis. Since 1909 she has had a number of operations, namely, for gall-stones, kidney stones, appendix, removal of tubes, removal of ovaries, radical hernia, and secondary operation for hernia, besides eight miscarriages in close succession, for which she had three curettements. Recently she was admitted to Mercy Hospital, in the surgical service of Dr. McGlannan, for intestinal obstruction. However, the condition was relieved by an enema. At this time she was typically myxedematous, as characterized by the wrinkled face, puffed eyelids, broad nose, large ears, prominent lower lip, dry and brittle hair, dry, harsh skin, brittle nails, slow pulse, and subnormal temperature. Physically she was weak and sluggish, but

the mental and nervous symptoms were not well marked. She showed considerable apathy, with slight depression and some impairment of memory. She was of a roving disposition, and any money she could get into her possession she spent in traveling. Thyroid extract in five-grain doses, t.i.d., had a very beneficial effect.

CASE 3.—*This case is unique and peculiarly interesting, inasmuch as it illustrates the cardiac syndrome of both hyperthyroidism and hypothyroidism. Another feature of interest is the emotion-influence on the reduction of temperature.*

Female, aged thirty-five. In her early life she had scarlet fever, diphtheria, rheumatic fever, and typhoid fever. Later she suffered for years with appendicitis and gall-stones. She also had a large uterine fibroid. Twelve years ago symptoms manifested themselves which later led to the diagnosis of hyperthyroidism. This condition was characterized by tachycardia, profuse sweats, and general tremor, which at times affected her legs so that she was barely able to stand. She was nervous, excitable, and emotional, and afraid to be alone or to cross bridges. In 1911 she became pregnant, and on account of the fibroid she required a Cæsarian operation. At the same time an appendectomy, hysterectomy, and cholecystostomy were performed. She made a splendid recovery, but gradually her entire condition changed.

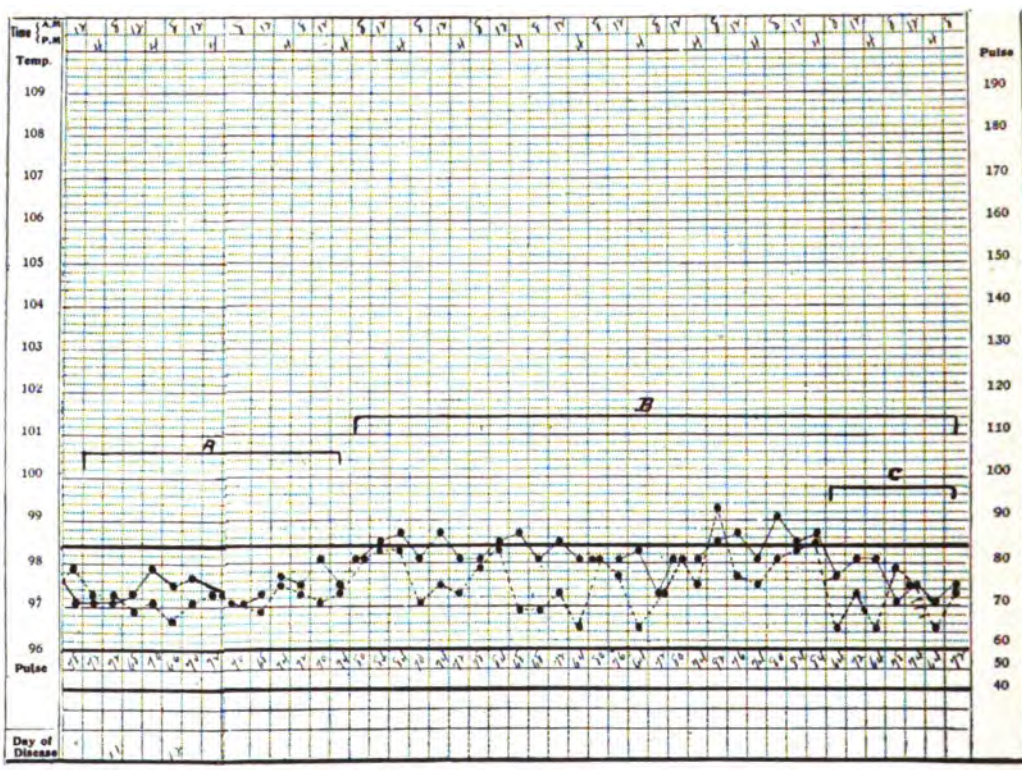

Chart illustrating Case 3. Continuous line represents temperature; interrupted line represents pulse. *A* shows condition of pulse and temperature before the administration of thyroid extract. *B* shows the influence of thyroid extract. *C* shows the effect of a depressing emotion—namely, a sudden severe disappointment—upon temperature and pulse while taking thyroid extract.

Her weight increased from the average of 108 pounds to 134 pounds. The pulse became slow, averaging from 60 to 65; blood-pressure averaged from 90 to 105; and temperature became subnormal. The skin became dry, nails brittle, and the hair lusterless. The psychical symptoms also changed, so that at present she has no fears and is able to go shopping or visiting by herself; nothing seems to excite her

owing to her condition of apathy and depression; she is physically sluggish and languid. For years she suffered with cardiac distress, principally attacks of palpitation, associated with profuse sweating. She was very apprehensive about these attacks and could not be persuaded that she did not have some serious organic heart disease. They averaged from three to five attacks daily, lasting an hour or more. The slightest noise or excitement provoked an attack. For two years she was unable to go upstairs on account of her heart. About three months ago the character of the attacks changed; they were no longer associated with palpitation and sweats. Instead of being conscious of her heart's action, she felt—to use her expression—as if she had no heart. They came on suddenly and continued intermittently for about an hour. During the attacks the lips and fingers were blue. There was a profound sense of oppression and great restlessness. These attacks came on without any exciting cause. For five years she took strychnine regularly, frequently as much as 1/20 grain three times a day, besides digitalis. The heart attacks, mental and physical depression, as well as her general symptoms, improved after the administration of thyroid extract.

CASE 4.—*Representing the usual clinical type.* Male, aged forty-three. At the age of twelve he had diphtheria; otherwise his health had been good. Several years ago he began to suffer with intense headache and backache. At the same time he noticed that his pulse had become slower than normal, averaging about 68, sometimes reaching as low as 60, and that his temperature was continuously subnormal, averaging about 97.5°. The skin was dry, the hair falling out and turning gray. He had an excellent memory; in lecturing to students he never had occasion to use notes until these symptoms developed, but subsequently he was unable to lecture without notes and felt dull and drowsy and lacked power of concentration. Physically he was not much depressed. His weight remained stationary—135 pounds. The administration of thyroid extract for three months caused his headache and backache to disappear. The pulse and temperature became normal, and memory was restored. He now enjoys good health.

CASE 5.—*Epilepsy, hyperthyroidism followed by hypothyroidism, hallucinations, and mixed trophic disturbances.* Female, aged thirty-one. When a child she had scarlet fever and mild epileptiform seizures. For years she had repeated attacks of tonsillitis. She suffered severely with dysmenorrhea, and the menstrual flow was very scant. At the age of eighteen the uterus was dilated. An examination revealed a normal uterus with small atrophied ovaries. Within the last year she began to manifest symptoms of hyperthyroidism, namely, slight enlargement of the gland, tremor, rapid pulse, vasomotor disturbances, and a mild stare. A rest treatment with corpus luteum and calcium lactate improved her general condition, diminished the frequency of the epileptiform seizures, and relieved her menstrual symptoms, especially with regard to the pain, and the flow, which became more profuse. In the past few months she noticed a change in her symptoms. She had mild hallucinations, most frequently seeing mice or rats running past her on the floor. She noticed them particularly when she turned her head to the side. They appeared so real that she would be startled and, if sitting down, would raise her feet from the floor. Her memory became so impaired that she had to depend upon memoranda. She was easily irritated, worried, and depressed. Her hands and feet were always cold and perspiring. The rest of the skin was dry and harsh, and the nails thin but not brittle. The hair was soft and extremely oily. There was puffiness of the eyelids, but the movements of the eyeballs were normal. Salivary secretions were excessive and mouthfuls of saliva constantly accumulating. There was a definite tremor. Pulse was 82, blood-pressure 110, and temperature subnormal. Her weight had increased from 120 to 145

pounds. On administration of thyroid extract, the hallucinations disappeared after the second dose, and thus far there has been no return. There was also a decided improvement in her general condition.

CASE 6.—*Myxedema with hypopituitarism and fat dystrophy.* Female, aged thirty-eight. She had two attacks of pneumonia and one of pleurisy. In 1905, when she graduated as a nurse, her weight was 180

FIG. 1.—Showing the appearance of Case 6 before treatment.

pounds. This increased gradually for several years; then she gained more rapidly until she reached 244 pounds. At this time she presented the characteristic symptoms of myxedema. On account of her mental and physical disability she was obliged to discontinue nursing. Her memory was greatly impaired. She was unable to perform the slightest physical tasks. She looked older than her years. Her face was round and full. The hair, skin, and nails showed characteristic trophic disturbances, and there was marked dystrophy adiposus, especially of the breasts, which varied much in size. She suffered from severe headaches, shortness of breath, and vesical irritability. She improved rapidly on thyroid extract. Her entire expression changed, and she lost 29 pounds in weight. She became mentally alert and physically active, and was able to resume her vocation.

CASE 7.—*Hypothyroidism with ovarian deficiency.* Female, aged nineteen. In childhood she had measles, scarlet fever, whooping-cough, and diphtheria. She developed normally until the age of thirteen, when her weight began to increase rapidly. At sixteen, the time of my first consultation, she weighed 220 pounds. At that time her bodily movements were sluggish and she was always tired. Mentally she was dull and listless, and her memory was poor. The hair was coarse and dry; eyes dull and lids drooping. Her pulse was 98 and her

FIG. 2.—The same patient after four months' administration of thyroid extract.

temperature normal. She had never menstruated. Her general condition improved on thyroid extract. Her weight came down to 198 pounds and she began to menstruate. When corpus luteum was given in addition to thyroid extract the progress was more rapid. At the present time she is enjoying good health and is engaged in work which requires mental as well as physical endurance.

CASE 8.—*Chronic hypothyroidism in which the cardiac symptoms so overshadowed the general symptoms that a diagnosis was not made for seventeen years.* Female, aged forty-three. She enjoyed good health as a child, with the exception of repeated attacks of tonsillitis and possibly diphtheria. She was active physically and mentally all her life. At the age of sixteen, when going to school she began to tire readily. During the past seventeen years she has complained chiefly of cardiac attacks. These attacks were characterized by a slow, feeble pulse, persistent and incessant yawning, especially on exertion, a feeling of profound sleepiness and exhaustion, and a sense of oppression about the heart. Occasionally they took on a different character, being associated with a feeling of intense excitement, irritability, and restlessness, and a throbbing of the heart and an irregular pulse, unassociated with yawning or sweating, but with a profound consciousness of a disturbed rhythm. In both forms of attacks there was pallor and sometimes lividity, with a tendency to cyanosis of the fingers. During the attacks she was obliged to lie down. They recurred at irregular periods, sometimes two or three in close succession. At one time she was free for a period of two years. During the past two years they have increased in frequency, severity, and duration, lasting from several hours to a week, during which time strychnine in large doses was administered hypodermically. There was no exciting cause ascribed for them. They occurred at times when she was sitting quietly or asleep during the night. Menstruation began at the age of thirteen and was normal, lasting four or five days. At the age of twenty she began to suffer with dysmenorrhea, and during the succeeding years either dilatation or dilatation and curettement was performed five times. The flow had become very scant and lasted only two days. A gynecological report in 1909 showed that the appendages were normal, and the uterus was small and freely movable. Coincident with the menstrual changes there was a gradual increase in weight, from 112 to 149 pounds. At the same time she became mentally dull and apathetic, although her memory continued normal. She has had some hallucinatory disturbances for short periods, when she would see mice at frequent intervals for several days.

Examination September 1, 1914: Patient was just recovering from a mild attack of typhoid fever. She was well nourished, skin sallow, face round and unusually wrinkled, lid-slits narrow, upper lids drooping, and lower lids puffed. The nose was rather broad, the cheeks flushed, and the tongue, in the words of the patient, was "too thick." The feet and legs up to the knees were swollen and the skin indurated, but there was no pitting. This swelling at times had extended to the groin. The pulse-rate was 60, the temperature subnormal, and the blood-pressure 90. The pulse had not been above 60 for years. Pressure on the eyeballs slowed pulse. Dyspnea occurred on exertion. The administration of thyroid extract promptly relieved all her symptoms.

CASE 9.—*Exophthalmic goitre; postoperative thyroid deficiency.* Female, aged twenty-two. For years she suffered with chronically inflamed tonsils and frequent acute attacks. She also had appendicitis a few years ago. Tonsils were removed and appendectomy was performed. Coincident with her chronic appendicitis symptoms of goitre developed, the most characteristic of which were loss of weight, exophthalmos, positive Von Graefe, enlargment of the thyroid, marked tremor, local sweating and tachycardia. There was considerable improvement for a time on rest and the usual medical treatment. Then she met with an accident, after which the symptoms became suddenly aggravated. As she derived no benefit from medical treatment this time, thyroidectomy was performed. After the operation her general condition rapidly improved. Pulse became normal, tremor disappeared, and her expression changed completely. The pulse, which before the operation averaged between 90 and 100,

was reduced to 64. Her weight increased from 112 pounds before the operation to 123 pounds. She complained of tiring readily and was indisposed to exertion. She became mentally sluggish, rarely perspired, and suffered from constipation. Headache became an annoying symptom. She suffered from irritability of the bladder. She had painful menstruation and at times amenorrhea. These symptoms improved on thyroid medication. She became more vigorous mentally and physically and was able to enter a school for nurses.

CASE 10.—*Hypothyroidism simulating nephritis.* Female, aged forty-one. She enjoyed good health until eight months ago, when she noticed marked swelling of the face, abdomen, and extremities which showed some pitting on pressure. There was also shortness of breath. The heart was rapid, but the sounds were normal. Blood-pressure was 128. Repeated examinations of the urine were negative for albumin, and the functional elimination was normal. The thyroid was slightly enlarged, smooth, and soft. There was slight tremor of the hands, dryness of the skin, and the hair was dry and brittle. The nails also showed trophic changes. Her temperature ran a subnormal course. Her face was round and full, the eyelids puffed, and she was mentally depressed. She also suffered from cholelithiasis. Various therapeutic measures were employed. There was more definite improvement on the use of thyroid extract than on any other plan of treatment. Her weight, which was 181 pounds at the beginning of treatment, was reduced to 156 pounds. Her mental condition showed decided improvement, the expression became brighter, and the edema disappeared.

CASE 11.—*Hyperthyroidism simulating nephritis.* Female, aged thirty-nine. Patient had measles at the age of ten. This was followed by a severe paroxysmal cough, which has persisted to the present time. She has been stout for a number of years, weighing 220 pounds. The skin and hair were dry. She looked dull and was mentally depressed. Her memory was seriously impaired, and physically she was unable to do the ordinary duties about the house. The cough at times was harassing, lasting for an hour or more. During these paroxysms of coughing she was perfectly helpless and had to be assisted to her home if she was seized with an attack on the street. In fact, she was unable to go to church or theater, and for some time would not venture to the grocery store in the neighborhood on account of these severe paroxysms. Three years ago her case was diagnosed nephritis, although at the present time there is no evidence of any kidney lesion. The effect of thyroid extract on her cough as well as her general condition was most remarkable. The paroxysms at once subsided and she was able to resume her household duties and visit places of amusements, etc., without any inconvenience.

CASE 12.—*Hypothyroidism with cholecystitis.* Female, aged thirty-four. Menstruation began at eleven years of age. She always suffered with dysmenorrhea. Her uterus was dilated at eighteen, the right ovary was removed at twenty-four, and another dilatation was performed later. Several years ago she had an operation for appendicitis. At that time she weighed 128 pounds. Since then there has been a steady gain in weight, and at present she weighs 165 pounds. Recently she developed symptoms of cholecystitis. She complained of severe headaches, and for the past two or three years noticed an impairment of memory and mental dulness. She slept well, ate little, and was readily exhausted. Micturition was frequent and painful; urine was negative. The skin was very dry and the hair was falling out. The heart sounds were normal; pulse 68; blood-pressure 105; and temperature subnormal. This patient promptly recovered from her symptoms by the use of thyroid extract.

CASE 13.—*A doubtful case, possibly dysthyroidism, in which the symptoms were aggravated by thyroid treatment.* Female, aged thirty-one. She had measles when four years of age and a mild attack of typhoid at ten, after which she suffered

continuously with constipation. She has taken purgatives almost daily since twelve years of age. Menses which began at fourteen were regular, profuse, and lasted five days. During her six years of married life she had three abortions, each one followed by endometritis, which lasted in each instance about three months. Since then the periods have been scant and lasted only two days. For a time she used sedatives and hypnotics freely, such as bromides, morphine, trional, and veronal. The patient looked nervous, but had a good color and was apparently overnourished. Lid-slits were very narrow. She had a decided malar flush. The tongue was tremulous and swollen and showed marginal indentation. The thyroid showed a soft, smooth, symmetrical nodule, the size of an English walnut, in the left lobe, which was freely movable. The right lobe was not palpable. The hair was extremely dry and brittle, the hands pale, nails thin, and the skin dry and rough. Heart and lungs were negative. The pulse was regular—84. She had a marked habitus enteroptoticus, with tenth ribs floating and right movable kidney. She suffered with a catarrhal appendicitis and mucous colitis. Her general condition did not improve after appendectomy and a prolonged rest treatment, and her symptoms were aggravated by the administration of thyroid.

CASE 15.—*Symptoms of hypothyroidism with lues.* Female, aged thirty-nine. She had measles and whooping-cough in childhood. Menstruation was normal. She had four still-births, usually terminating at about the sixth or seventh month of pregnancy. The last one was ten years ago. Since then she has given birth to two healthy children. She indulged to excess in alcohol and gave a positive Wassermann reaction. She has been nervous and emotional all her life. Her normal weight was 105 to 109 pounds. In the past four or five months she gained about 50 pounds. She became extremely weak and languid and unable to sleep or do any ordinary housework. Recently she became drowsy and depressed, and has had mild hallucinations and illusions. Her memory was not much impaired. She voided urine frequently. Her face was round and wrinkled. She had a markedly double chin, besides several large folds of fat in her neck, and tremendous breasts and abdominal folds. There was swelling of both upper and lower eyelids and the lid-slits were very narrow. Malar flushes were marked. The mouth was dry and the tongue thick. The cervical glands were not enlarged and the thyroid was not palpable. The hair was dry and brittle and turning gray. The eyebrows were thin; the skin thick, dry, and inelastic. The hands were moist and cold, the fingers short and thick, and the phalangeal joints enlarged. Visceral examination was negative. The pulse was normal and the temperature slightly below normal. She left the hospital without taking treatment.

CASE 16.—*Symptoms of hypothyroidism with ovarian deficiency and ileocolitis.* Female, aged twenty. She suffered for years with attacks of tonsillitis. Her menstruation was regular and apparently normal until after her marriage two years ago. Since then they only appeared twice. She has not been pregnant. With the cessation of the menses her weight rapidly increased from 120 to 155 pounds. She recently developed some nervous symptoms with anaphrodisia and loss of weight, and became very drowsy and stuporous. She sleeps on an average of fifteen hours out of twenty-four, and then has to be aroused. In her own words she feels "lazy, tired, and sleepy" and unable to work. Formerly she was bright mentally and physically active. Her hair was very dry and falling out in large quantities. The skin was dry and harsh. The pulse was regular—88. The blood-pressure and the temperature averaged about normal. The eyelids were slightly puffed, but the eyes were normal. The thyroid was not palpable. For five months she has had an ileocolitis with diarrheic stools. Thyroid therapy relieved her stupor and dulness, but did not favorably influence her other symptoms.

THE HEART OF THE CANCER PROBLEM.

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The world is gravely overwrought upon the theme of cancer. This is partly due to the sensational journalist, who scents a profitable field of prolonged fructuation: and partly to the sensational physician who is bent upon the exploitation of some novel scheme of treatment. These two enterprising publicists naturally play into each others' hands. Note the avidity with which the irresponsible space writer on the giddier sort of publications lays hold of and exaggerates the wildest and least sustained proposals of the medical miracle man. And the latter with a keen perception of the wisdom of garnering immediate returns is not averse to the notoriety obtained in this questionable manner. It is to the sordid advantage of both to scare the public into the sort of frenzy that grasps at any escape from the threatened horror without too minute an examination of its merits. The means to this deplorable end are statistics.

It is recognized that statistics are adaptable to the purposes of the statistician. They possess an amazing pliability, rendering them available for the support of either end of an argument. Skill in manipulation will produce almost any desired result. Note the perfect satisfaction obtained by both the high and low tariff man from the consideration of the same set of figures. It would appear to be absolutely decisive for or against any economic proposition to quote the mathematical conclusions. Yet it is so utterly indecisive in this case that the thinking world is hotly divided upon the point at issue. The fault of course lies not in the figures but in the legerdemain of the special pleader. Faced with the apparently unanswerable proof that cancer is increasing by leaps and bounds, we are assailed and bewildered by a multitude of methods designed to stem the tide.

To be sure, if cancer is widening its area of devastation at the rate declared by these alarmists, the surgical method of dealing with it is hopelessly discredited. If the local origin is successfully disputed, then it is a felonious pretence on the part of the surgeon to subject the sufferer to the pain and expense of a useless operation. If it springs from some inherent defect in the constitution of the victim, it is certain to recur no matter how complete the surgical interference, unless we can put our finger on the defect and remove it. The only scientific procedure under this hypothesis is to study the question of predisposition, and endeavor to find the vicious influence that causes certain individuals to react malignantly to irritations that are harmless in others. On the raising of this cry imagination, released from the curb of responsibility, runs riot through a perfect nightmare of mad conjecture. No absurdity seems too extreme to enlist a host of supporters. Despite the palpable fact that we do not know what constitutes predisposition, our ears are troubled by a torrent of surmises purporting to explain the mystery and point the way to a successful therapy. We are solemnly assured that it consists in faulty metabolism, eventuating in the elaboration of tissue poisons inciting erratic cell development. The consumption of proteids in excess of the needs of the economy stimulates this toxic tendency. The urine of cancer patients bears ample proof of this, as it is rich in the ethereal sulphates. It is urged that this constant association of ethereal sulphates with malignant disease indicates a common origin of both, namely, a proteid diet. We are earnestly adjured to abandon the use of animal food if we would avoid the incidence of this dread disease. Naturally this hypothesis is supported by statistics.

The countries where animal food is abundant are contrasted with the countries where it is displaced by cereals and vegetables; and the conclusion is drawn that the former are much more prolific of cancer than the latter because of this difference in the character of the staple diet. England is contrasted with India and Ireland. The English eat much meat; cancer is increasing

among them. The Irish eat less meat, and cancer is less prevalent among them. The natives of India subsist largely upon rice, and cancer is still less prevalent among *them.* In the minds of the advocates of the dietary etiology of cancer this appears to be a knockdown blow. But it simply illustrates the contortions possible to a set of figures in the hands of a disingenuous or overzealous manipulator. Only such items as make for his purpose are included in the record. Everything tending to weaken his conclusions is coolly omitted; and he rams them home with an air of virtuous conviction. He forgets to tell us that Ireland differs from England in *other respects than the matter of diet.* Economic conditions are entirely dissimilar. England is a manufacturing country and Ireland is exclusively agricultural. England has thousands of men delving beneath the surface in her varied mines. She has other thousands toiling in her factories and stewing in her mighty cities. Ireland has a population nine-tenths bucolic. She works no mines. She runs few manufactories, and most of her children live close to nature. Here are differences that may make for differences in the cancer total. With regard to India the contrast is more glaring still. Climatic conditions, occupational irritations, and all the minutiæ of social existence, have a bearing on the problem as well as the single fact of customary food. Again, in such a country the collating of vital statistics has been haphazard and imperfect. Diagnosis has unquestionably been at fault and deliberate concealment not infrequent. These considerations would incline us to believe that given the occurrence of cancer at all among a vegetarian people the number of cases if correctly tabulated would not be so strikingly out of proportion to that among the meat-eating peoples.

The urinary analysis as a hint to probable predisposition is without scientific importance because nothing is found peculiarly distinctive of cancer. Nothing is claimed by the proponents of this method of forecasting malignancy except the constant occurrence of conditions present in the urine under many other circumstances. The ethereal sulphates are not diagnostic of cancer. Hence although they might be demonstrated in every case of cancer, their presence in other deranged conditions blurs the accuracy of this indication. You cannot predicate cancer of every patient with indicanuria since he may be worrying along with a case of intestinal putrefaction. It will take more than the usual findings to establish a diagnostic criterion. Something found only in the urine of those subsequently succumbing to the invasion of the unknown cause will be necessary to dignify this method by any other term than that of a random shot. As our genial friend Mark Twain might have phrased it, "a shot delivered at great random." The objectionable feature of this theorizing does not consist in the loss of time consumed in reading it, for it is often quite entertaining, but in the diverting of the patient's attention from the only method offering any real hope in the light of our present knowledge. Patients will dally with this or that etiological will-o'-the-wisp until a point has been reached where the services of the surgeon are performed under the least favorable circumstances. In handling a situation of such tremendous gravity nothing should be considered but the incontestable facts of general experience.

Experimenting with dubious devices to escape the surgeon's knife is a cruel waste of the very limited opportunity afforded for the radical cure of the neoplasm. The time consumed in the attempts to correct an alleged defective metabolism, in the employment of the various sera, vaccines, rays, and pastes, is irreclaimable and vitally necessary to the preservation of life. This does not mean that inquiry shall cease and that we shall sit down contented with the meager information we possess about cancer and the poor returns for the enormous efforts put forth by the tireless operator. It means that we shall do the patient the service of operating as soon as his condition is made out and shall confine our experimentation to the inoperable cases. And this experimentation should be conducted in the seclu-

sion of the scientific laboratory and should not be ventilated until something positive has been achieved, so that the lay press may not get hold of some unproven hypothesis and set the public afire with expectation that cannot be realized and may divert it from the only rational procedure in any given case of malignancy. This is no indictment of the better class of lay publications, which undoubtedly strive to deal honestly with their readers. But it is in the very nature of the subject that those unacquainted with its full significance should grasp at inconclusive utterances as authoritative deliverances and thus unwittingly play into the hands of the unscrupulous quack. The one dictum that should be dinned into the public ear is that cancer is a *local* disease curable in its earlier stages wherever accessible, and dangerous only from neglect. It is not constitutional. It has no tendency to recurrence if completely removed. There are no roots deep in the organism that serve to restore it after its excision. It is not hereditary. If it were "in the blood" it would certainly be transmitted in numerous well-authenticated cases to succeeding generations. There is no gainsaying the fact that there is something out of tune in the tissues that react malignantly to irritation. Nevertheless the removal of the growth and the protection of the patient from further irritation completely obviate progression or return. Nothing will bring back that cancer but a repetition of the trauma. Why the gravest injury should leave no degeneration in its wake and injury of the most trivial sort should be thus hideously prolific is a mystery merged in the unknown constitution of the individual protoplasm. We do not understand even the most rudimentary elements of this amazing problem. We know nothing about it at all.

Cancer is alleged to be a disease peculiar to the decline of life. If by cancer we mean only a carcinoma the allegation is correct. But if we include sarcoma, we note the distressing fact that youth is often the victim of cancer. The term epithelioma or carcinoma is applied to an abnormal proliferation of the epithelial cells. The term sarcoma is applied to an abnormal proliferation of the connective tissue cells. Both results are disastrous, the sarcoma possibly possessing the more virulent propensities. The cancer cells are packed in clusters and rods, and by their pressure devitalize the encompassing tissues, and sending out offshoots into the lymphatics, rapidly traverse long distances and transplant the malignant elements in other localities by the process known as metastasis. What constitutes the original focus of invasion? Is it really an invasion, or is it simply an inversion of the normal cells of the part, unaccountably incited and compelled to proliferate downward? It is thought to be a species of microscopic harikari whereby the normal tissue thrusts itself into abnormal relations, thereby transforming itself into an agent of destruction.

It is noteworthy that while malignant disease increases in frequency as the meridian is passed, the fuller returns to systematized investigation reveal its tendency to push toward the other extreme of life. Cases of carcinoma under forty are no longer surprising, and cases under thirty are occasionally encountered. This preponderance after middle life, however, is of vast practical importance in warning us to be careful of the effects of acute or prolonged irritation at that time. A blow in the breast may be sustained with impunity by a woman of twenty; the same blow may be fraught with the gravest results in a woman of forty. A protracted eczema of the nipple in a young nursing woman may be treated with very little concern; the same thing in a woman past the climacteric may develop into Paget's disease and carcinoma of the breast. A chronic disturbance of digestion in the young may be treated with comparative unconcern; in the elderly it may portend carcinoma of the stomach. Not only may it portend this awful sequel, it may even produce it. No patient within the zone of suspicion should tolerate such a condition one hour longer than necessary. It should be treated energetically, and if it fails to respond, surgical intervention

should be seriously considered. *It is impossible to overemphasize that assertion.* Most of our cases of carcinoma of the stomach come to the surgeon after years of trivial tinkering with haphazard treatment. The surgeon is prepared to do his full duty to these patients if the internist will let him have the cases in time.

A rasping tooth may annoy a youthful tongue; it will almost surely malignify an old one. There is a continuous stream of incurable cases demanding operation after the cancer has firmly entrenched itself in the cervical lymphatics. These patients are in a most pitiable state. An operation means the loss of the tongue with all its inevitable distress, certain recurrence in the pharynx, and death from obstructed deglutition. To add to this hideous plight is the steady aggravation of the maddening pain and the realization on the part of the patient that he has lost his battle. Despair and physical torture combine to make death a welcome relief. It is impossible to practice a charitable fraud on such a patient because the condition is well within his own range of perception. Were the invasion elsewhere in his economy he might fatuously nurse "the hope that springs eternal in the human breast," and fade away in a fool's paradise of pardonable self-deception.

With Lady Macbeth we might fervently exclaim "Out, damned spot!" when we encounter the case of intermenstrual staining. There should be no paltering indecision in attacking the uterus and getting rid of the "damned spot." It is a danger-signal of the gravest moment. It is a literal red flag raised to warn us of the sneaking advance of carcinoma uteri. It is madness to ignore it. It is utterly inexcusable, utterly indefensible on the part of any medical practitioner to miss its import. It should be so forcibly impressed upon the mind of the women coming up to the dangerous age that none of them will view it with indifference. Often we may lay the flattering unction to our souls that we have not been remiss in anticipating other cancerous developments because the signs have been obscure, but in the matter of this intermenstrual spotting it is as if a clarion voice bellowed the diagnosis in our ear and commanded action. To be sure every case of intermenstrual spotting is not premonitory of cancer. A curettage will frequently dispose of it definitely and finally; but until the investigation is exhaustively accomplished no man knows whether or not he is facing a situation full of the direst menace.

It is indisputable that every lump in a woman's breast should come out as soon as it is discovered. It is unimportant whether her age be above or under forty. The threat should be heeded and precautions taken to prevent its accomplishment. There are too many instances of atypical prematurity in the development of carcinoma to render a waiting policy justifiable. The little lump in the breast of the woman of twenty-five may be airily waived aside as assuredly benign until one day adhesions are noted to the overlying skin, and the doctor awakes to the dreadful realization that he has trifled with her life by overlooking the exceptional appearance of malignancy in the young. *Now* operation means the sacrifice of the whole breast and the unnerving uncertainty regarding recurrence. A life is embittered and perhaps destroyed by stupid inaction in the face of obvious indications. The little lump in the female breast should rank in significance with intermenstrual spotting. It is safe to assert that if these two indications were properly heeded cancer would be reduced in women to the occasional involvement of the face, tongue, or stomach. The mortality from cancer in general would be tremendously reduced by these simple precautions. It would quickly appear that the reputed constitutional tendency to cancer could be overcome by a little foresight in dealing with initial manifestations. This would involve an absolute negation of the constitutional origin. It is lamentable that in view of the simplicity of the measures necessary to forestall malignancy there should be any accessible growth allowed to become formidable. Where the decision rests with a physician it is incomprehensible. The public should be taught to go to the

physician with every departure from normal appearances.

Moles and warts and scars are prone to degenerate if subjected to repeated irritation, especially in the evening of life. These abnormalities should be kept under intelligent observation, and if they display any activity or arouse any unusual sensations should be immediately put in the hands of the surgeon for speedy excision. The senile keratoses so common on the skin of the old, the little wart-like excrescences and little scurfy patches so frequent on their faces and their hands, offer peculiar opportunities for the development of epithelioma. They have been called "halfway houses" on the road to malignancy. They should be subjected to no avoidable irritation, and above all should not be "treated" with the meddlesome notion of cleaning them up. They should be handled with gloves, as it were, and gently carried along to a quiescent end. The pressure of nose glasses has been sufficient to excite such a skin to perverse activity. The pressure of a tight hat-band has served to arouse the latent fury of an old and disregarded birth-mark. When the normal cells of a part are giving way to the paralyzing touch of advancing senility these aberrant pariahs, these treacherous non-conformists, seem to be invested with a new lease of life and viciously attack the host that has nourished them for years.

There are so many foolish practices that conduce to the propagation of cancer that one is struck with amazement that man has been styled a reasoning animal. Consider the way he abuses his mouth with tobacco. Cancer of the lip is admittedly due to the damage done by pipe or cigar. Yet men will go on smoking both in utter indifference to the possible consequences. Patients with leucoplakia due to syphilis will continually assail those damaged membranes with clouds of hot smoke and incite them to malignant reaction. So-called sane individuals who have miraculously escaped the pitfalls of life up to the age of forty will be discovered pulling hairs out of their noses, not because they were painful or unsightly, but because these meddlers have developed a *habit* of doing so, just as another sort of lunatic must continually bite his nails. Cancer has followed this delectable practice, as it was perfectly easy to predict. Another variety of demoniacal possession shows itself in pulling hairs out of the face. This is not done to extract an occasional ingrowing hair, but with the irresponsible impulse to pull out every hair that can be laid hold of. It is easy to see whither this will tend in a person old enough to take on cancer.

Without detailing every variety of irritation capable of inducing malignant degeneration, let it suffice to say that any continued annoyance of susceptible tissue may have this deplorable effect even in those supposed to be protected by the vitality of youth. Any acute disturbance of the nutrition of such tissue by a violent trauma may be irremediable. The assault may be so deadly that resuscitation is impossible and degeneration begins at once. The fact that some subjects resist successfully long-continued irritation and react favorably from the severest trauma is a comforting reflection that should deter us from crossing any bridge that we have not yet approached. Still it should not blind us to the significance of that structure when the bridge head comes in view. It is folly to lower one's vitality worrying over the possible consequences of a blow in the breast, and thereby invite the very disaster that we are hoping to avoid. Wait and watch. At the first sign of a lump cut it out, and the bridge is safely crossed. A policy of this sort, a policy of watchful waiting and preparedness, will bring cancer within the precincts of preventable and curable diseases.

The diagnosis of internal cancer is suggested by aberration of function or developments foreign to the normal contour of the part. Pain produced by the arousing of activity; abnormal secretions such as blood from the stomach at any time, or from the uterus at unusual times; new growths recognized by palpation or radiography—all these phenomena have a significance which if early appreciated may be

of the gravest interest to the patient. If the condition can be confronted in its infancy, so to speak, before it has become anything more than a premonition of evil, surgery may do wonders with it. After it has been located long enough to render recognition easy, it has rendered cure impossible. Persistent dyspeptic symptoms in the middle-aged, as we have already seen, should not be misinterpreted until the appearance of a tumor or a hemorrhage. The diagnosis of gastric ulcer should be made with the greatest caution in a person old enough to come under suspicion of cancer. Pain anywhere in the abdomen of a chronic character should spur investigation in the hope of racing cancer for the patient's life. In these days of radioscopy and the bismuth meal much may be anticipated that was hitherto surmised. By the shadow of denser tissue in the contour of the organs, by the evidences of constrictions, of ballooning and collapse, of the hollow viscera, we are apprised of the need of speedy intervention; sometimes only to encounter a kink, sometimes to encounter an operable cancer. The cystoscope will locate the source of a urethral hemorrhage, and enable us to get rid of a cancerous kidney and prolong the patient's life for many years. En route the cystoscopist is able to determine the condition of bladder and prostate. *X*-ray may supplement the cystoscope and settle the question of stone. The Wassermann reaction must not be overlooked in any case of dubious character. Experience illuminates that point vividly. Operations have been performed for luetic lesions within as well as without the abdomen. If a positive reaction is found, the most intensive treatment must be employed at once to resolve the doubt. For, unfortunately, it is possible for a patient to have a four plus Wassermann and a cancer, too.

The diagnosis of cancer of the skin rests on observation and palpation, assisted by the modern arms of precision. Sometimes in our doubt we have to invoke the aid of the laboratory and the lens. If we are divided in our judgment between epithelioma and syphilis we may be promptly enlightened by complement fixation. Always remembering that here as in concealed situations the luetic may be the victim of cancer, this procedure is of great assistance. It indicates the first blow to be struck at any rate, and may be followed by a biopsy if the outlook does not speedily clear. The elements of confusion are not only the gross resemblance of the lesions, but their occurrence in patients within the cancer zone, and in positions favored by either disease. At the corner of the eye, for instance, or the edge of the nostril or angle of mouth, an indolent luetic lesion with an ulcerated surface may in a person of forty odd easily be mistaken for an epithelioma. And while this error would not be as serious as the reverse, it would involve an awkward explanation and much embarrassment. If the epithelioma is typical it displays certain characteristic features that are quite eloquent to the practiced eye. It is very slow of progression. It has an elevated border and a shallow ulcer. The border is rolled or pearly. This appearance is usually sufficient to warrant a diagnosis. Even if the entire periphery is not of this peculiar formation, here and there will be found little pearly nodules, quite as conclusive. These pearls are the gross manifestations of the cells or nests that are made by the inversion of the epithelium. The luetic lesion will travel in a month farther than the cancer will in a year. But this is not always a safe distinction, because cancer may be exceptionally rapid and histories are notoriously unreliable. The secretion of the cancer ulceration is scant and odorless as a rule and dries into a thin scab that is easily detached, with bleeding. The secretion of the luetic ulceration is profuse and fetid, and dries into a crust that is quite thick and does not cause bleeding on detachment. Both may have an indurated feel if long established.

The manifestations of tuberculosis rarely come into question with those of cancer, because as a rule the two diseases begin at opposite periods of life. Tuberculosis will show itself as lupus or tuberculosis verrucosa cutis or scrofuloderma. Even if there

is a precocious appearance of cancer or a tardy appearance of tuberculosis cutis, the distinction is usually not difficult if the pearly border of the one and the apple-jelly nodules of the other are borne in mind. It is conceivable of course that lupus may be so grizzled from age that the apple-jelly nodules may not be demonstrable; but here the very fact of its long continuance will carry it back beyond the age at which cancer is likely to begin, and give it an existence altogether too prolonged for the malignant growth. Warty lupus with its roughened aspect, its minute abscesses, and its violaceous zone of congestion is unlike epithelioma with its pearly edge and ulcerated summit. Scrofuloderma is the cutaneous reaction to the pus oozing from a tuberculous gland.

Of cancer of the skin rodent ulcer is the simplest and least malignant. It is a shallow ulceration presenting little or no infiltration or elevation and gradually extending and scabbing. It may go on for many years, as there is little tendency to metastasis until it invades rich lymphatic areas or some organ like the eye. The habitat of the rodent ulcer is the upper part of the face, the temple, forehead, and side of nose. This is the explanation of the tardy metastasis, as cancer above the mouth line is prone to prolonged localization. Another inexplicable whim of this perplexing malady is its avoidance of the upper lip and its prevalence on the lower. This too in the face of coincident and identical irritation. It is difficult to understand how holding a cigar or pipe between the lips should only affect the lower. It reverts to the trite and unanswerable question of predisposition. Here we have evidence of predisposition in spots. Not only is one sort of tissue more predisposed than another, but different parts of identical tissue are differently affected. Of the dozen seborrheic warts on the senile countenance one will degenerate without any apparent reason and the others will remain innocuous. Verily the whole subject of predisposition is so little understood that it is vain and vapid vaporing to prate of altering it by diet or any other constitutional assault. If we do not know what we are about it is the part of wisdom to be about something else. Stabs in the dark on any theory of etiology simply divert valuable energy into wasteful channels and rob the patient of the only safe recourse within our comprehension.

The papillomatous variety of cancer is pretty accurately described by its title. It is developed from the papillæ of the corium and is in touch with tissues that rapidly take on malignancy and transport it to remoter regions. This will ulcerate on the summit and present a pearly periphery. It might without any straining of imagery be called the little machine gun of epithelioma, because of its rapid fire and destructive action.

Epithelioma may appear as a little nodule whereof the summit will presently cave in, producing what has been described as the crateroid variety. This, too, is of the rapid-fire brand.

Epithelioma of the parchment type is a very misleading condition. There is no infiltration; no ulceration; nothing but a yellowish discoloration of the skin with a slightly accentuated periphery. It resembles nothing so much as a patch of morphœa. It is peculiarly insidious because of its nondescript appearance.

Carcinoma en cuirrasse is the revolting culmination of the scirrhus of the breast that follows nodular infiltrations thereof. It has been known to envelop the whole chest front and back.

Paget's disease is a malignant affection of the nipple and areola resulting in carcinoma of the breast. It resembles eczema so much that the costly error is frequent. It differs from eczema as follows: Eczema is bilateral, Paget's unilateral; eczema occurs in young mothers, Paget's in elderly females; eczema itches, Paget's does not; Paget's feels like a coin under the skin. Both ooze and scale.

Any case that resists the applications for eczema in a woman who is not nursing a baby should be viewed with grave suspicion, and every precaution taken to establish its identity before we are jolted into our senses

by the appearance of nodular infiltrations of the breast and the unmistakable onsweep of carcinoma. Time spent in the reiteration of this deplorable contingency is very well spent indeed, for we often encounter the destructive actuality in full and irresistible career. Time was when it could have been halted. Precious moments those, not to be wasted.

Benign cystic epithelioma is an anomalous growth that, possessing the structure of true epithelioma, rarely becomes malignant. It is a puzzling paradox. It is multiple and affects the face and trunk. Its lesions are small nodular, pearly, or yellowish growths, sometimes crossed by little blood-vessels. How may we understand the malignant degeneration of healthy tissue under various degrees of irritation, when we are confronted by these abortive products of true cancerous construction? They resemble a body without a soul. Everything is prepared for the onset of real malignancy except that indefinable something that vivifies the cells. The cancer nests are there, but the cancerous activation is lacking. May we not be permitted to speculate upon the confounding contradictions of this distracting disease, when tissue already erected into the likeness of cancer will linger along in aimless imitation, and other tissues anatomically correct will blaze into malignant activity under the prod of a corset steel? Why do the half-way houses mentioned above (the little seborrheic warts and moles) offer better inducements to the onset of the disease than the completed edifices on strictly cancerous models?

Melanotic cancer is developed from a melanotic nevus as a rule, or it may supply the pigment to a non-pigmented growth. It is rapidly fatal. Many of the cases described heretofore as melanotic sarcoma are really instances of carcinoma. However, this is a distinction of little value to the patient, as under either title it is a very malignant malady. The multiple pigmented sarcoma of Kaposi is a rare idiopathic affection, of purplish nodules scattered over the limbs and trunks. It is commonest on the legs and usually begins there.

There is one phase of the disease only that lends any sort of color to the possibility of hereditary transmission. Xeroderma pigmentosum seems to be a family disease. Perhaps on a fuller understanding the interplay of coincidence or the operation of other causes will be found to supplant heredity. It also emphasizes the occasional assault of cancer upon the tissues of the young. It may be summarized as a premature senility of the skin. It has also been called sailor's skin because of its weather-beaten appearance. It begins with freckling, followed by atrophy and telangiectasis, and after a variable period by little warts that soon develop true cancerous ulceration. In the early stages it resembles an *x*-ray burn. The latter, as is well known, has a marked tendency to degenerate. Which goes to show that the untoward effects of *x*-ray are a premature aging of the skin; and this goes to show that it should be used with great discretion not only in the treatment of epithelioma but also in the treatment of other dermatoses, wherein the second condition of the patient may be worse than the first.

Acanthosis nigricans is a disease of the skin associated with internal cancer, but, strangely enough, although replete with the sort of lesions that are prone to epitheliomatous degeneration, this development is not observed. Always an evidence of malignancy elsewhere, the warty excrescences that characterize its cutaneous manifestation remain unchanged. Here is one of the oddest anomalies encountered in the history of cancer. The predisposition to cancer is present, for the patient has cancer of the viscera. Yet lesions that are ready to assume malignancy, such as pigmented warts under other circumstances, remain benign in this malignant association.

The prognosis of cancer is ominous. Undeterred by art it will steadily advance until it eventually kills the patient. If a diagnosis can be made early enough to allow of its complete removal by the knife, the prognosis is good. No dependence

whatever is to be placed upon the division of epitheliomata into malignant and benign. The least ill-reputed of them, with a record of consuming half a lifetime in covering a few inches of skin, and a reputation of rarely involving the lymphatic glands, may under given conditions change its whole aspect and make an unexpected attack upon the citadel of life. It is folly to trust to its continued benignity. The patient with it is sleeping over a mine. Nothing that we can do by influencing metabolism can retard the progress of these growths. We may diet the patient according to any formula; we may restrict the ingestion of any supposed provocation. The net result of our efforts will be the deterioration of the patient's resistance to such a degree that the neoplasm will encounter less difficulty in subduing the normal cells.

Other enthusiasts have urged the wonderful efficacy of some chemical formula for the destruction of the growth as soon as it can be made out. While these men may be mistaken in the efficacy of their application, at least they recognize the essential fact that they are dealing with a *local* disease that can be got rid of by *local* means. They are safer guides than the dieticians who would alter metabolism in some vague and inexplicable manner and thereby render the cells inhospitable to cancer. Yet all the chemical methods devised, whether followed by any substantial success or not, are simply clumsy and barbarous attempts to imitate the knife. Whatever they may accomplish the knife will accomplish better.

X-ray has many enthusiastic supporters as a remedy for epithelioma. Aside from its competency to produce epithelioma in hitherto normal tissues unless manipulated with the greatest skill and judgment, it is no more successful than the knife, when its greatest praise is sung, and it may fall short of such achievement and leave a recurrent and less favorably situated growth for the surgeon's offices. There may be situations where operation is so much dreaded or so dangerous that something offering a chance of success, without its disquieting accompaniments, is a positive desideratum. But where there is freedom of choice of the best possible thing to do, *x*-ray should not be put before the scalpel.

The status of radium is undetermined. There are evidences of real cure and there are tales of recurrence. Whether further investigation shall sustain or discredit it no one can forecast. Where operation is permissible radium should not be substituted. Where operation is impossible it may be tried with perfect propriety. It is the world-old choice between the certain and the uncertain. If a measure offers a positive advantage it is foolish to discard it for one offering only a problematical advantage. Of two evils choose the least. Hold fast to what is proven. Subject your patient to no unnecessary risk of recurrence by adopting means still in the experimental stage. Remove the neoplasm if removal is possible. If it is impossible, resort to any means supported by observers of established reputation. Avoid all glittering novelties. Disappointment is more paralyzing than dumb endurance. Give your patient the best chance that reason offers, but steer your course with due regard to the false lights and siren songs that frequently lure the traveler to destruction.

The sum of our certitude concerning cancer is that we have several reliable hints of its impendency, a positive means of diagnosis, and an absolutely certain method of cure in early cases favorably situated. The thing we need to know is how to recognize it soon enough to give the surgeon a reasonable chance of success. *That is the heart of the cancer problem.* All considerations of etiology, heredity, and predisposition fade into utter insignificance as compared with the feasibility of early recognition. What matters it whether the essential cause be a parasite, a metabolic perversion, an embryonic rest, or hereditary propulsion, the one thing of practical moment is how to prevent its taking the life of the patient. If we cannot prevent its incidence we can defeat it of its prey. If we are at sea concerning much of academic

interest, we are perfectly secure upon the one point of vital importance to the victim. If instead of befogging the issue with all sorts of inconsequential wranglings over purely theoretical considerations, we would combine our energies to educate the people to the saving grace of premonitory symptoms, we should soon lay the monster helpless on his back in the field of his fiercest depredations.

We who urge the local origin of cancer and discourage the freakish methods of treatment supposed to represent "advanced" ideas are invested by our opponents with various contemptuous titles, among which "reactionary" is high in favor.

We are not reactionaries. We do not revert to the past for our inspiration. We favor progress. We favor investigation. We favor experimentation. But not at the expense of human life. The man who confides himself to our care is entitled to the best known treatment. Mark the emphasis on "known." He is entitled to the best effort resulting from the sober thought and fruitful experience of the medical world. We applaud progression. We favor the sifting of every method offering reasonable hope of enlightenment. But we protest against the misuse, for purposes of experimentation, of the precious life committed to our tender mercy. The broad proposition that it is for the advantage of mankind in general does not excuse our treachery to the individual. To reduce this to the concrete: the little tumor appearing in a woman's breast should not be subjected to the problematical action of any system of diet, sero- or organo-therapy. No time should be wasted in *trying* anything. The fact that we can cheat malignancy by cutting out the tumor leaves us morally no choice. We *know* that this method will be effective. We can only *hope* for results from the others. Reason, honor, and duty command the action to be taken. And the apparent access of malignant fury throughout the civilized world is in some measure due to our indifference to that command. For some reason or other, be it for utter lack of reason or a strabismic misconception of our obvious obligations, we permit ourselves to be led away into devious paths, seeking vainly for that which lies under our hand, striving by unproven and delusive methods to attain an end already within our grasp if we will but turn our eyes at the behest of wisdom and close our fingers on the prize.

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DELIRIUM TREMENS AND DRUG HABITUÉS IN PUBLIC INSTITUTION PRACTICE.[1]

BY L. P. SPEARS, M.D., LOUISVILLE, KENTUCKY.

My reason for presenting this paper is to incite a general discussion upon the subject, because the majority of medical practitioners frequently see cases of delirium tremens, "dope cases," etc., and not a few of the former occur as complications in surgical practice.

The mention of "dope cases" is made (*a*) because the recent Federal Law has uncovered many such which were formerly unknown even to physicians; (*b*) because the law makes it necessary that physicians prescribe accustomed drugs to habitués with great care or not at all; (*c*) lastly, and by far the most important, to correct a fallacy, and to summarize the treatment of such cases in a few words.

In steady drinkers—*i.e.*, those who daily take an injurious amount of alcohol, and especially those with an hereditary tendency to alcoholism, insanity, or neurotic instability—any acute alcoholic excess may induce an attack of delirium tremens. Its development is usually regarded as due to the prolonged toxic effect of alcohol upon the nerve centers, but it is also largely dependent upon impoverished nutrition of the cells in the gray matter of the brain and

[1]Read before the Society of Physicians and Surgeons, of Louisville, Kentucky, Feb. 17, 1916.

spinal cord. It more frequently occurs in individuals who consume spirits than in those who habitually use wine or beer. An attack may be precipitated in a heavy drinker who has had some depressing shock to the nervous system, such as that produced by a fracture of the leg, fracture of the skull; an operation for appendicitis, gall-stones, etc.; also by acute infections, pneumonia and erysipelas being predisposing causative factors. Personally I believe an insidious toxemia of intestinal origin is the determining cause in the vast majority of instances. Eliminating surgical causes, I have yet to see a case of delirium tremens develop in a man who could eat, retain, and digest any part of the food ingested. Invariably the same history is presented: "Doctor, I got to drinking, and my stomach went back on me, so I just had to drink more to keep going."

In the treatment of delirium tremens in prison practice I have not every hospital facility, nor have I nurses or trained male attendants to assist me in the carrying out of necessary orders. I have to depend upon prisoners to act as nurses. The disadvantages are overbalanced by the fact that the patient is under the necessary restraint, away from a frightened, oversympathetic family and friends. The treatment must necessarily vary slightly, according to the intensity and stage of the attack when the patient comes under observation.

A mild attack will only require elimination with five grains of calomel and fifteen grains of bicarbonate of soda, a hot bath, and plenty of water by the mouth; it being understood that restraint and abstinence from alcohol begin with entry into the institution. I might mention, however, that such patients may be given what is commonly known as "shake," consisting of a mixture of tincture of capsicum (3 ounces) and fluid extract of lupulin (1 ounce). This mixture is administered in teaspoonful doses at intervals of two, four, or six hours, according to the indications; and is the only form of alcohol used. It stimulates the entire alimentary tract; it acts to a certain extent upon the intestine; it stimulates the gastric function; the patient begins to eat and digest food. Unfortunately, however, mild cases are seldom brought to us; the majority that we have to treat are extreme cases, in which the patient is brought to jail possibly charged with acute insanity, or has been arrested for malicious destruction of property, for trying to kill himself, his family, friends, or any one else coming within reach. In cases of this kind such refinements as nurses, hot baths, purges, etc., are not to be considered, and the desideratum to be obtained is sleep. Here is a place for argument, for certain physicians will recommend and employ various drugs to obtain this result.

Paraldehyde is probably the drug most extensively used. I do not like it, and long ago placed it in the discard along with iodoform and such evil-smelling drugs. My principal objection to paraldehyde is that the patient goes to sleep drunk, awakens drunk, and remains drunk from its effects for several hours; and very frequently you will have a paraldehyde habitué. Morphine rarely quiets such patients, and will often add to the delirium and toxic effect. Hyoscine is very uncertain, but gives magic results in certain cases of motor sleeplessness, and may be combined to advantage with apomorphine 1/20 grain and strychnine 1/30 grain hypodermically. Chloral hydrate and huge doses of the bromides are used extensively with good results; but chloral cannot be given in sufficiently large doses without danger to the patient. Sulphonal and trional are only mentioned to be thrown into the discard.

For the last two or three years I have used veronal exclusively as the hypnotic in delirium tremens, and believe it is better and safer than any of the drugs previously mentioned. It can be given in large doses, and I have seen no deleterious effects. In serious cases ten grains are administered every two or three hours until sleep is produced, and in a few instances I must admit that eighty grains had to be given before the patient could be overcome. Such a patient will likely sleep six or eight hours,

and then awaken with mind comparatively clear; he will possibly partake of some nourishment, or a large quantity of water; and will be given a saline. Within a few hours a modified delirium may return, but this also will be amenable to veronal—five, ten, or fifteen grains again producing sleep.

Food during active delirium is neither necessary nor desirable. Its introduction into the stomach is inadvisable, because it would be imperfectly digested, or perhaps remain undigested, and would only add to the motor unrest and cardiac depression. If any food is taken it should be liquid, solids being given only when the patient's mental state has become clear, and after free purgation has been secured by salines. Milk rendered alkaline so it will pass through the stomach and be digested in the small intestine is best; buttermilk is also an ideal food at this time.

Practically all the patients coming under my observation during the last two or three years with delirium tremens have received no other treatment than that outlined in the foregoing. Usually the pulse is very fast, high tension and throbbing. Under such conditions I believe the so-called heart stimulants, such as strychnine, digitalis, caffeine, etc., will do more harm than good; their use might well be compared to whipping a tired horse you expect to drive a long distance. The heart needs a sedative, and sleep with relief of motor restlessness will do the most good. After the patient has recovered his mentality, he will likely have a small, weak pulse which may need stimulating with strychnine or digitalis. Caffeine I never use because of its tendency to increase insomnia and motor unrest.

In regard to "dope cases:" It gives me great satisfaction to state that where I now have one such case, I had ten before the new drug law went into effect. This law is a good and just one, and while it is violated by a few unscrupulous doctors and avoided by a few habitués, the vast majority of "dope" fiends find it most difficult or quite impossible to obtain supplies of their favorite narcotic drugs.

There is a belief current among the laity, and possibly not a few doctors, that if the accustomed drug be suddenly removed the victim will die. This I believe to be a fallacy, and my experience is that the only satisfactory treatment is complete and immediate withdrawal of the drug. If asked for an opinion as to the best and most successful method, I would summarize the entire treatment in the three words—*remove the drug.* Patients treated in this way may suffer intensely, and may not sleep for three nights and days; but after that their recovery is rapid and most satisfactory.

In a small percentage of cases the patient may develop a profuse diarrhea, for the relief of which may be given, at intervals of two or three hours, 5 minims of the deodorized tincture of opium, and large doses of bismuth. When they ascertain from the taste that the medicine contains opium, some of the patients unless prevented will drink the entire contents of the bottle. Such patients are usually denied further medication of this character until such time as the medicine can be taken according to written directions.

The change in the character and the improvement in health and general appearance of these individuals is little short of marvelous; and after their desire for the drug has disappeared their appreciation is sometimes touching. While I cannot give the percentage of permanent cures, my belief is that it is much larger than generally supposed, especially in individuals who have been or are afterward total abstainers from alcoholic beverages. When under the influence of liquor they lose their willpower and determination to remain free from the drug, they soon seek their old haunts and there mingle with undesirable company, and relapse into their former miserable condition.

The most difficult patients to manage are the users of morphine and cocaine combined. I recall a rather remarkable case of this character where the patient had been taking twice daily, according to his statement, thirty grains of morphine and fifteen grains of cocaine hypodermically. He was

to be deported, and to give him a night's rest, so he would be in physical condition to travel, I administered hypodermically six grains of morphine and two grains of cocaine, feeling that perhaps he had overestimated the quantities previously taken; but as only a slight relaxation was secured, his statement was probably correct.

In conclusion, I wish to say that a certain percentage of the Louisville public seem to think we have a "cure-all" for drunkards of all kinds at the county jail. Of course this is a great mistake; all that can be justly said is that we have a routine treatment, that the worst of them can be made at least temporarily sober and fit for their daily life in the society in which they move; but as for a cure, it is the same as all other so-called cures, purely a myth. In my opinion the only cases of alcoholism that can be cured are those where after treatment the individuals have the necessary will-power and determination to remain total abstainers.

TWO CASES OF CANNABIS INDICA INTOXICATION.

BY CHARLES W. BURR, M.D.,
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The following report illustrates the variability of the action of Indian hemp upon the cerebral mental centers of different types of people. More years ago than I care to remember, when I was a hospital intern and in the stage of mental development during which one is prone to believe only things seen and felt, and is avid of experimental knowledge of drugs, I and a medical friend each took a dose of cannabis indica, with the results detailed below. Both myself and my friend made careful and elaborate notes of our experiences at the time, and I am not therefore dependent on memory in reporting them.

At 7.30 P.M., one-half hour after finishing dinner, I took sixty drops (using an eye-dropper) of Parke, Davis & Company's normal liquid. Nothing happened till 10 P.M., when suddenly while playing cards I found that I could not distinguish clubs from spades nor hearts from diamonds. I tried to read, but could not distinguish the letters. Vision for distance was good. My pupils were widely dilated. There was, in short, palsy of accommodation. A few minutes later my mouth suddenly became very dry; thirst was intense and continuous, so that during the night I drank three quarts of water. At ten-thirty I was suddenly seized with a general convulsion lasting about three minutes, and not affecting consciousness or speech; indeed, I was able to assure my friend, who was much frightened, that I was feeling very well and that there was no danger of any evil result. The fit was, in the character of its movements and, I suspect, in my mental attitude, much like a hysteric attack. During it and continuously afterward, until I went off into a profound stupor, I had a quite marked feeling of well-being; I was supremely happy in a quiet, mentally unexcited fashion. I was not boisterous, not even noisy. There was no increase of intellectual power nor any false feeling of increase, but, till stupor came, I was able clearly to describe my sensations and quietly to discuss the different opinions of writers about the causes of the symptoms. Sexual thoughts were absent: Venus Aphrodite herself would not have tempted me. After the first convulsion I began to be very hungry, and during the night ate a whole cold chicken, a large loaf of bread, and much butter. I was able to talk about matters and things in general intelligently. Afterward my friend told me that at no time during the experiment did I speak delusionally or show the slightest incoherence, nor, though I said I felt very happy, did I talk boastfully or show any signs of mental exaltation.

I had six convulsions in four hours, all

resembling the first, all ceasing abruptly, and all looking as if they were wilful. As a matter of fact they were wilful, in the sense that I willed to convulse, and I knew I was throwing my arms and legs about in the wildest way, now writhing like a snake, now acting like a circus clown and making the most silly grimaces, but I could not will to behave otherwise. I suspect the hysteric subject, barring her sexual and religious mimicry, is in much the same emotional state as I was. I could postpone a convulsion for a few minutes, but soon the will to convulse overcame the will to inhibit. Thus once I was called to the ward: I went with my friend, whom I had warned to correct any wrong orders that I might give, and performed my duties properly, but while speaking to an orderly immediately afterward I felt the desire for a fit coming on, and was only able to stave it off till I reached my room and shut the door, a period of probably three minutes. I am aware that my statements about the relation between will and the convulsions are paradoxical, nevertheless they are correct. I was compelled to will.

About 11 P.M. I began to have a feeling of prolongation of time. A minute, measured by the watch, seemed like fifteen or twenty. This slowing of time could not have been due to a very rapid flight of ideas, because thought was not rapid, nor to such profound thinking that I paid no attention to time, because I was not wrapped in thought at any time. It was not due to *ennui*, because I was anything but bored; on the contrary I was intensely interested. I had some but not a marked feeling of enlargement of space. My room seemed about its usual size, but the corridors of the hospital, really short, looked to me quite long. For about two hours before stupor seized me I came, at times, as near to simultaneous double consciousness as is possible. Truly synchronous double consciousness is a psychological impossibility, because two separate groups of ideas cannot occupy the center of the field of consciousness at the same moment, but the change from one personality to the other was so rapid that the time between was unmeasurable and the two personalities seemed to overlap. I was most of the time myself, sitting in a chair in my room, but occasionally I was at almost the same time some one else, sitting in a boat floating through the sky amid pink clouds. The feeling of being not myself was clear and definite and yet indescribable. My other self and the boat were visually clear and distinct; the clouds were vague. Myself, sitting in the chair, saw my other self in the boat. This was the only hallucination I had. It recurred about half a dozen times and never lasted longer than one minute.

I finally became very drowsy, muscularly exhausted from the violence of the convulsions, and went to bed at 4 A.M., falling asleep immediately, and continuing in a drunken sleep till 9 A.M., at which time my friend awoke me. Throughout the day I had a feeling of rather comfortable tiredness, of dreaminess, of unreality, but no one suspected I was under the influence of a drug. It required a distinct effort of the will to hold my attention to any long conversation. During the experiment there was no change in the respiration rate, but my pulse increased to one hundred, and I passed large quantities of urine of low specific gravity but otherwise normal. I had no tactile anesthesia, no analgesia, no paresthesias, no loss of power in the legs or arms, and never went into a trance, though, as stated above, throughout the following day I felt dreamy and absent-minded.

Four days later my friend imitated my experiment under the same condition. He took the same dose out of the same bottle. His symptoms were entirely unlike mine, except that he too had a palsy of accommodation, dryness of the mouth, and thirst. He felt no effect till two hours after taking the drug, when he was suddenly seized with a feeling that he was dying from suffocation. This sensation lasted about four minutes and recurred at pretty regular intervals of twenty minutes for three hours.

There was no objective disturbance of breathing and no disorder of the pulse. At the very time he was saying he would die because he could not breathe he was breathing quietly. He had no convulsions, no change in the time sense, no feeling of enlargement of space, no hallucinations. After about three hours the subjective dyspnea ceased and he went into a deep sleep. Being with him during the periods of his fear of death was the most horrible experience I have ever passed through. I have seen three men conscious at death who knew they were dying. Only one really feared, and his agony was nothing compared to that of my friend who was in no danger. The dissimilarity of the two clinical pictures must have been the result of differences in the material, in the personalities, the drug acted upon.

It is noteworthy that drugs which in large dose cause unconsciousness and in smaller ones affect the emotional and intellectual side of man vary in the symptoms they cause in different people before unconsciousness is reached. This is notoriously true of alcohol. It is no less true of opium, cocaine, and Indian hemp. It is true, but in less degree, of ether. The physiological action of drugs which affect only organs other than the brain is much more constant. Those which affect mentality vary greatly in action, the difference in effect depending on the personality of the subject; the others act on all men similarly. Digitalis acts in the same way on all hearts, physically alike, no matter how much their owners may vary in mental make-up. Quinine has the same physical effect on the genius and the common man, the race-horse type and the plough-horse type, the quick-witted and the dull. This difference in effect is a large factor in the production of drug habitués. Many men, for example, who boast of not being drunkards have nothing to boast of save a thing they are ignorant of, namely, that alcohol does not produce in them sensations that are produced in the man who becomes a victim of the habit. They are not drunkards because they are not subjected to temptation; their cerebral, cellular protoplasm does not have an affinity for alcohol.

It is not surprising that drugs which affect the cerebral mental centers are more inconstant in their action than those which act only on other organs because, since mind is the most recently acquired human function, it is the most unstable or rather the most delicately poised. On the other hand it is not always the people who are superficially the most nervous, in the common meaning of the word, who are the most susceptible or who present the most marked idiosyncrasies of drug action. We occasionally see people whom one would expect to be profoundly affected by moderate doses of morphine or alcohol bear quite large quantities without any evidence of being under the influence of any drug. More rarely we see men who are stolid who are tremendously affected, and sometimes in unexpected ways, by very small doses. We cannot, therefore, to any great extent as yet, use the cerebral action of drugs in helping us to make a psychological classification of man, though there is a close relation between drug action and personality.

TREATMENT OF POLIOMYELITIS.

In the course of an article on this topic in the *Medical Record* for July 15, 1916, MYERS advises the local application of 10 per cent silvol or argyrol to the nose, with hexamethylenamine in large doses internally and the performance of lumbar puncture.

For prophylaxis—silvol or argyrol to nose and hexamethylenamine in moderate doses internally in the case of all children who have come into contact with a positive case.

Myers bases these suggestions upon the facts that the nose is probably the portal of entrance of the infection and that hexamethylenamine when taken internally will be found in the cerebro-spinal fluid. Also, on the supposition that lumbar puncture will carry off some of the infecting organisms and their toxins.

EDITORIAL.

ACIDOSIS OCCURRING WITH DIARRHEA.

We have on a number of occasions called attention in these columns to investigations concerning the presence of so-called acidosis during the course of infectious fevers such as pneumonia and typhoid fever, and also in the digestive disorders of childhood. There can be little doubt that this fertile and interesting field has, as yet, been only approached, and that it contains opportunities for future work which promise scientific and life-saving results.

Our attention has been called once more to the matter by an interesting communication made to the *American Journal of Diseases of Children* for May, 1916, by Howland and Marriott. They found that during the course of attacks of severe diarrhea, not of the ileocolitis type, in infants it is not uncommon to note very distinct alteration in the respirations, the usual abdominal type of respiration in young children being supplanted by one which is not only abdominal but costal. The respirations are also of greater amplitude and apparently are made with some effort. In other words, they are heaving, and the thoracic movement may be so great as to distinctly bring into play the auxiliary muscles of respiration. Even when these symptoms are well developed, however, there are none present which indicate obstruction to the free ingress and egress of air, nor is there any evidence of cyanosis; furthermore, the rapidity of the respirations is not greatly increased. Occasionally there is some disturbance of their rhythm. Ultimately, if the case is approaching a fatal ending, the respirations become more and more feeble, although there may be occasional deep gasps. To use the words of Howland and Marriott, "it is as if the respiratory center were exhausted by the exertion which it has undergone."

Stimulated by a number of investigations carried out by others these clinicians in their study seem to have proved that the respiratory symptoms to which we have called attention are dependent upon acidosis. There is a distinct increase in the ammonia output, but they are unable to determine positively the significance of this, although we are all familiar with the fact that it occurs in the acidosis of diabetes and other conditions.

In carrying out their investigations Howland and Marriott studied the carbon dioxide tension in the alveolar air, pointing out that, so far as they are aware, this aspect of the matter in infants has not previously been looked into. They consider that the lowered tension of carbon dioxide is to be considered as an indication of acidosis. In other words, they found in a considerable number of their cases of diarrhea, in which respiratory symptoms were present, that a lowered tension was a constant factor. They also found that the administration of alkalies to these patients relieved the excessive breathing and resulted in the return of normal carbon dioxide tension in the blood. As an estimation of the carbon dioxide tension in the alveolar air cannot well be carried out by general practitioners, this part of the research has little interest to most of our readers, but from the practical standpoint it has great importance, as is manifest from the results which are achieved by the use of alkalies.

The question naturally arises as to the cause of this acidosis. Is it due to the development of abnormal acids in the body in an excess which the kidneys fail to eliminate, or is it due to the fact that these acids combine with bases in the body which, being eliminated, are then lost to the organism? It is interesting in this connection to note that the examination of the urine of these patients with diarrhea showed no more traces of acetone than are frequently found in normal conditions.

The examination of the blood for beta-oxybutyric acid and diacetic acid showed that these ketone bodies are in excess of the normal amounts, but, on the other hand, that they are never present in quantities

comparable to those that are found in the acidosis due to accumulation of these substances in cases of recurrent vomiting and other conditions. Thus, if it be considered that normally the total ketone bodies in infants vary from 5 mg. to 15 mg. per 100 Cc. of blood, in cases of diarrhea with well-marked acidosis the ketone bodies vary in amounts from 15 mg. to 30 mg. per 100 Cc. of blood, an amount much too small to account for the symptoms. Howland and Marriott, therefore, do not believe that the ketone bodies play an important part in the development of the symptoms which are described in this class of cases, but nevertheless these signs are manifestly associated with a form of acidosis. The increase in the ketone bodies is due to the partial starvation, but is too small in quantity to produce symptoms.

Concerning the question as to whether the symptoms result from the loss of bases from the body by way of the intestinal tract, it was found that the excretion of sodium and potassium by the bowel was greatly increased, but it was also found that the excretion of chloride was increased still more. In other words, the loss by the bowel consists not only in elimination of the base, but in its combined acid as well.

Finally, the question arises as to whether the symptoms are due to the retention in the body of substances which the kidneys fail to eliminate, partly because the purging removes so much liquid that there is not enough fluid for the kidneys to act properly. Howland and Marriott believe that there is some evidence to support this view, and have come to the conclusion that in all probability the acidosis occurring with severe diarrhea is not due to the ketone bodies but to the retention of acid phosphate because of renal inactivity.

In regard to the matter of treatment they give the following excellent advice, which we cannot do better than quote:

"It is necessary to consider here only the treatment of the acidosis that complicates the diarrhea. To the accepted methods of treating the diarrhea itself we have at the present time nothing to add. So long as the ultimate cause of the acidosis remains obscure, we cannot employ direct measures to prevent its development. The acidosis may result, though it has not yet been proved, from loss of bases by the intestinal tract. The excessive diarrhea should be prevented, if possible, by moderate doses of opium, for in any event the draining of the body of water cannot be an indifferent matter. Opium in some form, such as paregoric, may be given, preferably in small doses, frequently repeated, to be reduced or stopped when the evacuations diminish in frequency or copiousness. Water must be given freely by mouth, if possible; if vomiting prevents this, as it frequently does, it must be given by rectum, subcutaneously or intravenously.

"If, as has been suggested above, the acidosis is due to the retention of acid phosphates, the excretion of these substances and the consequent prevention of acidosis would be greatly facilitated by a copious secretion of urine. When acidosis develops, the secretion of urine is very scanty and often ceases for hours at a time. Under such circumstances it is most difficult to increase the activity of the kidneys. All measures should be used to prevent the cessation of the activity. The best of these is the constant administration of water or salt solution in one of the ways mentioned above.

"When the presence of the acidosis is determined by the hyperpnea or by some laboratory test, energetic treatment is required. Alkalies must be administered promptly, until the reaction of the blood is again normal. We have used sodium bicarbonate for this purpose. This may be given by mouth, by rectum, subcutaneously, or intravenously. Vomiting often prevents the administration by mouth, and absorption by the bowel is unreliable in the presence of diarrhea. The soda may then be given subcutaneously or intravenously. When a sufficiently large vein can be found, intravenous administration is the method of choice, even if there is vomiting. Immediate action can thus be obtained. The strength of the solution for intravenous use

is 4 per cent. Depending on the size of the infant, from 75 to 150 Cc. should be given and repeated in three hours if the hyperpnea does not cease. A large amount of alkali is required, for not only is the alkalinity of the blood reduced but also that of all the tissues of the body. After one or two intravenous injections, the soda should be continued by mouth in doses of 1 to 3 gm. every two or three hours until the urine is alkaline to litmus. Should it be impossible to give the soda intravenously, the solution may be injected subcutaneously. There is always danger under such circumstances that necrosis of the tissues will result. The danger is minimized if certain precautions are taken. The solution (either 2 or 4 per cent) is sterilized by heat. By this procedure, however, a large part of the bicarbonate is transformed into the carbonate. As the carbonate is intensely irritating to the tissues, it must be transformed back into the bicarbonate. This may be done by bubbling carbon dioxide through the cold solution to which a few drops of phenolphthalein have been added until it becomes colorless. From 100 to 300 Cc. may be employed at an injection and should be given very slowly.

"The administration of soda by one or the other method will often overcome both the clinical and laboratory evidence of acidosis. We have frequently seen the hyperpnea disappear, and all the tests show the reactions to be found in the normal infant. Nevertheless, the child may die—indeed, such is usually the case. The cause of death under such circumstances is not clear. It is possible that as the result of the acidosis certain processes have been initiated which render life impossible, or certain others may have been inhibited without which life is impossible. It is sufficiently clear that the condition resulting from or accompanying the acidosis is most serious even if its exact nature is not understood. Therefore in all cases of severe diarrhea, even though there are no evidences of acidosis, it is advisable to use sodium bicarbonate until the urine is alkaline. Its administration may prevent the development of acidosis. When further observations have made clear the processes on which the acidosis depends, we may be able to direct our treatment more intelligently. At the present time we are forced to combat the result and not the cause."

THE STATUS OF VACCINE TREATMENT.

If optimism in regard to therapeutic procedure did not maintain a high place in the minds of those men who devote themselves to the practice of medicine it would be unfortunate for the human race. Working indefatigably for the preservation of life, which, in the nature of things, must some day end, it is natural for the physician to accept readily, and steadfastly cling to, all propositions or statements which promise to aid him in his combat with disease. All too frequently the undue optimism of some professional colleague or the wrongful interpretation of results fills the physician with courage, with the end result, however, that disappointment must be faced.

When diphtheria antitoxin first came before us there were some who hailed it as a remedy which would prevent death in every case, because they ignored the fact that if the poison of the disease had been active in the body for any length of time it had produced lesions which no remedial measure can rectify; and so we found, as careful thought would have indicated in the first instance, that for the success of antitoxin therapy it is essential that it shall be used before the disease has been in existence long enough to produce definite lesions in vital parts.

Again, the introduction of salvarsan led some enthusiasts to the belief that at last a panacea had been obtained which would speedily eradicate the dread disease syphilis; and, once more, the promulgation of the theory of the opsonins and the introduction of vaccine therapy seemed to open up a wide field of therapeutic possibility. We now know, to a great extent, the limitations of salvarsan, and we are learning, day by

day, that vaccine therapy, like every method of treatment, is limited to certain types of cases, and that under certain circumstances its use not only does no good but actual harm.

It is an interesting coincidence that two papers should have appeared under the same date, one in New York and one in Chicago, dealing with this very question. The first paper by Dever points out that at the best vaccine therapy cannot be expected to do much in the severe acute infections, since beneficial effects from the use of vaccines are obtained through the production of active immunity, and as active immunity is developed relatively slowly it is difficult to understand how their employment will be of advantage to the patient who is suffering from an acute infectious disease, even though sensitized vaccines are employed.

Hektoen, of Chicago, after a careful critical summarization of the facts at our hands concerning vaccine therapy, states that it may be concluded that the general results so far obtained from the routine use of commercial vaccines, polyvalent and mixed, have no value as evidence for or against the curative usefulness of vaccine treatment. He points out, as does the previously mentioned author, that in subacute, chronic, or localized infections the results appear to indicate that specific vaccines properly and skilfully used have value because they increase the production of specific antibodies and also probably because they stimulate leucocytic and other activity. Dever believes that experience in the treatment of typhoid fever and pneumonia does not justify the use of vaccines in these diseases, and that hope for the future lies rather in the use of specific sera which supply the antibodies without calling upon the cells of the body to do additional work. It seems to us that the conclusions of these two writers are about as nearly correct as our present knowledge permits.

It is interesting to note in connection with the employment of vaccines in the treatment of typhoid fever and their intravenous injection that Hektoen is not at all convinced that this plan is advantageous. He points out that a critical fall of temperature in typhoid fever can be induced by the injection of other vaccines and several foreign substances, as, for example, various protein materials. In the 53 cases of typhoid fever treated with Gay's vaccine, Gay and Chickering found that no permanent benefit resulted in 34 per cent, lysis, or shortened duration, occurred in 25.5 per cent, and a cure by crisis in 41.5 per cent. They report no alarming symptoms from these injections, but others who have used different methods of injecting typhoid vaccine have reported collapse, hemorrhage, and high fever, with delirium and death. Hektoen, therefore, thinks that this treatment is not to be lightly undertaken.

It is interesting in this connection, too, to note that while results obtained from treating 53 cases are of interest they do not prove the correctness of any definite proposition, since many hundred cases are necessary for this purpose, and the fact that in these 53 cases no permanent benefit resulted in 34 per cent indicates that the method is not as definitely curative as one would hope it to be.

Hektoen believes we are entering upon a new and interesting development in the study and treatment of infectious diseases, but that at the present time vaccine therapy has a relatively limited field of usefulness, namely, in the subacute, chronic, and localized infections to which we have already referred.

This brings us into a consideration of the specificity of vaccines and of protein substances obtained from them. It would seem to be increasingly evident that these substances are responsible for the changes in the body which ensue when they are injected without their having any definite specific relationship to the primary infection. In other words, they may be considered in one sense as irritants, stimulants, or foreign bodies which rouse the system to increased endeavor to combat anything within it which is foreign or deleterious. Miller and Lusk have found, as have many others for that matter, that the injection of the products of bacterial growth, or of dead

bacteria themselves, which bacteria have no relationship to the illness of the patient, produce remarkable changes in the economy and often for the better. Thus, after having used typhoid vaccine intravenously in the treatment of typhoid fever they concluded that they would attempt to determine what results might be obtained if they injected albumose, and, using a definite albumose in the dose of one to two Cc. of a four-per-cent solution, they obtained the same results in the treatment of typhoid fever that they had obtained when using dead typhoid bacilli. Twenty per cent of the cases treated terminated by crisis after a single injection, while another twenty per cent approximately terminated their illness by rapid lysis; the balance continued until the normal termination of the disease without any influence being exercised, except temporary reaction characterized by chill and rise of temperature. In other words, their results were equal with both methods, and are practically as good as those obtained by other investigators who used typhoid vaccine alone.

Going a step further, Miller and Lusk decided that they would treat arthritis in a similar manner, but as their supply of albumose was scanty and they believed that the effects were produced by the injection of foreign protein, be its source what it might, they treated a number of cases of arthritis by injecting typhoid vaccine. Several of their cases of arthritis were definitely subacute and chronic in character, having lasted for a number of months. Great relief followed promptly after the first injection, and after three or four injections the patients were able to get about with comparatively little difficulty. Even cases of gonorrheal arthritis in many instances received marked benefit from these injections. Indeed, they state that one of them who had arthritis of the wrist for three months, with complete disability, recovered apparently completely within forty-eight hours after a single injection, with free movement of the infected joints, and, after a lapse of four weeks, there was no recurrence. Seven other patients with gonorrheal arthritis responded so well that they have been encouraged to continue the treatment of this type by injecting typhoid vaccine.

Discussing this matter from a more scientific aspect, Jobling and Petersen review the literature of the subject and attempt to offer some scientific explanation of the results which are achieved. They admit that they are as yet unable to bring forward a satisfactory explanation, but they assert that a whole trend of events is inaugurated when, as a result of the injection, the equilibrium of some of the delicate serum balances is disturbed, all of which tend toward a condition favorable for recovery from infection. This is not a very definite statement of results achieved, but is probably as near as our present scientific knowledge and methods of investigation can take us.

Going one step further, it is interesting to note that Louis D. Smith has treated a considerable number of cases of gonorrheal complications by the injection of various forms of antitoxic sera which were not specific. He treated cases of epididymitis, posterior urethritis, and chronic gonorrhea by such injections with good results, and, finding that these non-specific sera acted in identical manner, he went one step further and employed ordinary horse serum. He further asserts that normal horse serum can entirely replace antigonococcic serum and expresses the belief that the change produced by such injections is in the nature of anaphylaxis and has no bearing upon the particular type of infection.

Discussing the value of non-specific vaccines Jobling and Petersen state that because they are non-specific the medical profession could see no merit in them, and, calling attention to the so-called Schäfer vaccine, by which we presume they intend to refer to the products commonly called phylacogens, they add: "Here was a biologic product which, according to the observation of many competent observers, did at times produce striking results in a variety of infectious diseases. . . . The very fact that they did certain things at

times should have led to a study of why such favorable changes were brought about. The fact that it was palpably non-specific, however, was sufficient to warrant the stamp of disapproval by the medical profession. It is only within the last two years that a certain definite movement away from this rather narrow point of view has occurred."

THE TREATMENT OF THE PARALYSIS FOLLOWING ACUTE ANTERIOR POLIOMYELITIS.

There are few conditions met with by the practitioner of medicine which are more harrowing to the patient, the parents, and the physician than an attack of acute poliomyelitis. To see a child which, a few hours before, has been in perfect health fighting for breath, or, in the cephalic form, in convulsions, is misery enough, but when these conditions are followed by survival from the onset of the disease with degrees of paralysis which vary from complete loss of power to partial loss, the picture is almost as sad as it appeared at first. Under these circumstances it is natural that under the stimulus of the desire to do good, and under the urging of the relatives, the physician should attempt to institute active treatment. During the acute stage of onset it is probable that he can do practically nothing which is advantageous. Possibly immersion of the patient in a warm bath, or the administration of warm packs, if the respiration is not impaired, may exercise a beneficial influence. So, too, if there is fever the administration of minute doses of nitroglycerin and of sweet spirit of niter, because of its ethyl nitrite, may be advantageous in equalizing the circulation and producing mild perspiration. Oxygen may be administered if the breathing is impaired. Beyond this it is probable that little can be done.

No sooner is the acute onset over than its sequence, paralysis, occurs. Pressure is then exercised on the physician to institute measures for the removal of the paralysis and the reëstablishment of function. It is at this point that the physician's knowledge of the pathology of the disease should make him cautious, careful and rational in his efforts. When it is recalled that the lesions consist in acute inflammatory changes in the spinal cord or brain, chiefly about the trophic cells in the anterior cornea of the cord, it must also be evident that the administration of strychnine, the application of electricity and other stimulant measures are to be carefully avoided. The child's one chance is that the acute inflammatory process will rapidly subside, that a fair proportion of the cells will escape entirely, or in part, from the devastation of the disease, taking up once more not only their own function, but possibly the function of other cells which have been lost. We have, again and again, seen this point in treatment ignored and full doses of strychnine and arsenic and various forms of electricity resorted to without any good result, and often with harm. Absolute rest, as nutritious a diet as the digestion will tolerate, and giving the patient a chance to get well by regulating and keeping in line the various vital functions are about all that the physician can do. Later on when there is reason to believe, by reason of the lapse of time, that the inflammatory process has subsided and reaction has followed, the use of strychnine and electricity and tonic doses of arsenic, as a stimulant alterative, may be advantageous, but it is not to be forgotten so far as faradic electricity is concerned, or any form of electricity which results in muscular contraction, that the lesion is one which affects the trophic or nutritional cells in the cord. This results in failure of nutrition in the muscles and the muscles are unable to reëstablish or rehabilitate themselves when they are used at all vigorously by the patient, or if they are exercised, except very gently, by external means. In such cases any effort which is made to maintain the nutrition of the muscles had better be by passive exercise or gentle massage rather than by the use of electricity. When the case has passed into the stage of what might be called chronic paralysis the question as to the application of electricity may be decided only by a skilled electrotherapeutist. Some persons

think that the high frequency current is advantageous, but there does not seem to be any convergence of opinion in regard to this.

Concerning the use of electricity for diagnostic and prognostic purposes, Schaller has expressed the view that where there is complete reaction of degeneration the prognosis should be guarded, although many of these cases recover function, and, in the *Archives of Pediatrics* for July, 1916, he states that cases which show incomplete reaction of degeneration generally recover, while those that show no reaction of degeneration but only hypoexcitability can be considered as belonging to the class in which recovery is practically certain. Schaller also thinks that the mild galvanic current should be resorted to immediately after the febrile attack. Whether he is correct in this remains to be seen. In any event, treatments are given only three times a week, and, depending upon the number of muscles affected, are not to last more than 10 to 30 minutes. In a case of paralysis resulting from an attack occurring several years before, where the wasting is marked, Schaller believes that electricity can be applied to the paralyzed parts with some advantage in certain cases.

ALCOHOL AND CARBOLIC ACID.

Fifteen or twenty years ago a good deal of interest was aroused by the statement made on the part of a well-known New York surgeon that alcohol was an antidote to carbolic acid. He proved that he could dip his hands in carbolic acid, and then, if he immediately dipped his hands in alcohol, he did not suffer from a carbolic acid burn. Much discussion arose as to how this result was produced, and, so far as we know, no one was able to bring forward a satisfactory explanation of the fact. The conclusion was jumped at that if carbolic acid could be nullified in its effect by alcohol when applied to the hands, alcohol could also be used internally as an antidote when a poisonous dose of carbolic acid had been swallowed; but it was soon found that only 95-per-cent alcohol or absolute alcohol would protect the hands from carbolic acid, that dilute alcohol had no such effect, and that the administration of absolute alcohol by the mouth produced almost as evil symptoms of poisoning by dehydration and irritation of the tissues and by intoxication as did carbolic acid itself. We call attention to this because it is important that strong alcohol shall not be taken internally, and equally important that physicians should clearly understand that dilute alcohol has no antidotal value.

In 1915 Macht, by experimental methods, proved the correctness of the statement we have just made and showed that its administration might actually hasten death, although if an animal was intoxicated by alcohol before carbolic acid was given the lethal effect of the acid was not so speedily produced. It has also been shown that by the administration of alcohol the solubility of carbolic acid is materially increased, and the rapidity of its absorption is also thereby aided.

SURGICAL DISABILITIES OF TROOPS IN TRAINING.

It is obvious that even though a recruit may successfully pass a rigid physical examination, a strenuous course of training may be expected to develop weaknesses the presence of which could not have been forecast—some a source of permanent crippling, others easily and completely remedied by surgical procedure.

In this relation the article by Cutler (*Practitioner*, May, 1916) is of special interest. His experience was largely with troops in training—that is, with men who have passed their physical examination, and whose lesions in the main developed or became crippling incident to the training.

He calls attention to the fact that the majority of patients applying to him are rendered inefficient as soldiers by disabilities which in civil life do not appear to affect their efficiency. These disabilities were discovered either by the men themselves reporting "sick" for the condition, or they were revealed at one of the examinations

which recruits undergo when drafts are being formed for active service. In many cases the disabilities were present prior to enlistment, but a fair number of them were either directly attributable to the unaccustomed physical strain of a soldier's life, or were accentuated by it.

There were 87 cases of hernia, all operated upon—the patients not being put on active duty until three months after operation. Partly as the result of this prolonged period of convalescence Cutler believes he has had no recurrences. A further observation is made to the effect that during the same period there were 93 trusses supplied to men suffering from inguinal hernia, and there was not a single instance of strangulation; from which it seems logical to conclude that a soldier equipped with a properly fitting truss, who then undergoes a full course of training at home, may be as efficient on the firing line as his comrade who has undergone the radical cure. It seems fairly certain that no man should be rejected at the recruiting office as unfit simply because he has a hernia, provided it can be efficiently controlled by a truss.

It is particularly interesting to note operations for varicocele, in some instances because of real pain, especially along the route marches, the pain being referred nearly always to the testes. Orchitis is a troublesome postoperative sequel in a fair number of cases. These patients were ordered fourteen complete days' rest in bed and were given a subsequent furlough for twenty-eight days. The amount of pain and disablement bears no proportion to the size of varicocele. At times huge enlargements are apparently painless and non-crippling; at other times small dilatations may cause pronounced psychic and physical distress.

Regarding a comfortable varicocele as a disability has always seemed an absurdity to those most familiar with this local condition and its consequences. Moreover, in the case of a soldier it is probable that a properly fitting suspensory bandage would in the majority of instances be preferable to an operation.

In 10 cases hydrocele was operated on by excision or eversion of the sac, presumably because of the large size.

In 40 cases varicose veins of the leg were operated upon either by division of the internal saphenous high up or ligation and excision. It is noted that patients often complain of the large scars; they require twenty-eight days' furlough after immediate convalescence from the operation. The author makes no mention of the ultimate results.

Thirty-four cases of malposition of the little toe are recorded; the deformity consisted of the whole of the toe being dislocated on to the dorsum of the foot, overlapping more or less completely the fourth toe. The toes were amputated, long flaps being made in all cases. None of these patients had been disabled by the deformity in civil life, but experienced crippling pain as the result of the military training.

There were 21 cases of hammer-toe amputated, implying in each case absence from duty for a month. Hallux valgus and rigidus were treated by excision of the head of the first metatarsus. There were four thus treated, with benefit accruing to but one. The operation does not seem to be satisfactory for rendering a man capable of fulfilling full duties as a soldier. Twenty-one cases of ingrowing toe-nail were treated by complete removal of the nail and scraping of the nail-bearing area. There was a period of twenty-one days' disability.

Piles are regarded as distinctly crippling factors in army life, entirely unamenable to palliative methods, and to be treated by either clamp or cautery or removal. There is no record of the period of disability or of the ultimate results of operation.

Phimosis in 24 cases, hypertrophy of tonsils and adenoids in 24 cases, 4 cases of undescended testes, and 8 of fistula in ano are reported. The latter is regarded as a very real cause of disability, the author stating that he doubts if a man who enters the army with a fistula can ever be rendered fit for full service; with the strain of his work sooner or later the condition will

recur. This condition is readily overlooked in the recruiting office.

There were two cases of internal derangement of the knee-joint, the semilunar cartilage being removed in each case. Both men did well and returned to duty, but it is of doubtful advantage from the military point of view to operate on these cases owing to the prolonged convalescence.

Of 30 cases of appendicitis 24 were operated upon, one of them terminating fatally.

For a man to be of real value as a soldier he must be fit in every sense of the word. Before operating on a soldier it is necessary to carefully consider whether or not the operation will render a man fit to undergo training or will simply be a palliative measure. Though this latter procedure is obviously justified in civil practice, it is economically unsound in military practice. When the radical method of operating permits a man to return to duty quickly it is to be preferred to a less radical one, provided that at the same time the man is thereby rendered equally efficient. Too short a period of convalescence is to be avoided owing to the fact that it is practically impossible to graduate the training of a soldier so as to minimize the strain on fresh scars. Consent to operation is usually readily obtained; provided a man is reasonably satisfied that an operation for his disability will render him efficient, he as a rule willingly undergoes it.

HIGH INTESTINAL STASIS.

From the experimental standpoint, when the duodenum is occluded at any point less than 35 cm. from the pylorus animals die within seventy-two hours. When this occlusion occurs more than 75 cm. from the pylorus the animal will live at times much longer. From which it is apparent that in or about the first 35 cm. of the duodenum some change takes place under obstruction which causes the death of the animal.

Sweet, Peet, and Hendrix (*Annals of Surgery*, June, 1916) note that the symptoms of acute pancreatitis and of acute high obstruction are so alike that a differential diagnosis can only be made at operation.

Whipple and his associates have recently published a work which seems to prove that the toxic body found in their high loops is a proteose, and they have further shown that this purified proteose will exactly reproduce the symptoms of high obstruction when injected into a normal animal. This is a very different demonstration from the work of Murphy, of St. Louis, who found that the material from a loop of intestine which had been permitted to "autolyze," *sic* putrefy, in the incubator for some weeks, or the material from an infected gall-bladder, was toxic. Only the isolation of the poison and the proof that it reproduces the symptoms of the condition we are studying will prove anything.

For Whipple's demonstration that the toxin involved is a proteose makes it still more difficult to understand his previous contentions that this toxin is formed in the intestinal loop, or by the mucosa of the intestinal loop. For the formation of a proteose a proteolytic ferment is essential, and the mucosa is not supposed to contain any proteolytic ferment except the ferment erepsin, which is supposed to break down, not form, the proteoses.

In an animal in which, for a long time previously, the ducts of the pancreas have been tied, so that for a period no pancreatic ferments have been entering the intestine, an absolute high obstruction, without the formation of any loops, was produced. Three such animals have lived for seven and eight days, instead of the two to three days a normal animal will live with such an obstruction. Further, a toxic material has been obtained from loops of intestine in such animals which had no external secretion of their pancreas, but it was not a proteose. From the symptoms produced it would seem that this poison belonged in the class of the choline bases. The intestinal juice, while it contains no proteolytic ferment capable of producing a proteose, does contain a lipase.

Two findings in the course of this work are of major surgical interest: First, the

demonstration of the fact that a gastro-enterostomy opening does not function in the presence of a normal pylorus; secondly, the explanation of the similarity between acute pancreatitis and acute high obstruction—they are alike because they are both essentially the same thing, an intoxication with the toxic products of protein cleavage, in pancreatitis certainly due to the proteolytic ferment of the pancreas, in high obstruction not necessarily, perhaps, but in all probability, due to the same toxin, produced by the same ferment. In pancreatitis the escape of the products of the digestion of the pancreas into the tissues permits the intoxication; in obstruction the conditions of obstruction permit the absorption of toxic products, which under normal conditions would either not be formed, or if formed would be immediately broken down to non-toxic products.

There is another phase of this problem which may have surgical interest and importance. The work which has been done on stasis in the large intestine has all suffered from the fact that no one has ever been able to actually demonstrate any definite poison. Frazier and Peet have recounted their failure to find any such toxin; Strauss has recently reported experiments in which he demonstrated that segments of the colon can be indefinitely isolated. The old experiments of Halsted show that chronic ileal stasis can be indefinitely borne. Are we, perhaps, looking at the wrong end of the intestinal tract, even in these cases? The ptosis of the colon will certainly drag the head of the pancreas across the transverse duodenum, and, indeed, a dilated duodenum has often been reported in these cases. The removal of the colon would relieve this drag. In other words, given the demonstration of a toxin of great potentiality—less than one-tenth of a gramme of this proteose will kill a 15-pound dog in a few hours—would it not be well for the clinician to consider the possibilities of a chronic absorption of such a poison?

We are aware that surgery already possesses a plethora of theories; but as long as a theory is given its proper evaluation as a theory, as a working hypothesis, and is not accepted until supported by such an array of facts that the theory has itself become a fact, these theories offer the only means of progress in a field where so little is known.

REPORTS ON THERAPEUTIC PROGRESS.

MASSAGE IN GLAUCOMA.

BRADBURNE in *Ophthalmology* for April, 1916, says the effects obtained by massage of the eyeball in glaucoma may he held due to a combination of three actions, viz.: (*a*) Mechanical—that is, a direct alteration in the shape of the eyeball and the position in the eye of its various parts; (*b*) a tonic action on the ciliary muscle; (*c*) a trophic action upon the intraocular circulation—circulatory, secretory, and excretory. The results obtained will naturally vary by the share which each of these three has in the process and will be dependent in no small degree upon its method of application.

Massage can be applied mechanically or manually, and practically speaking in but two places: either directly through the sclera behind the junction of the sclera and cornea or directly along the optic axis on the center of the cornea. Manual methods by means of the finger-tip, through the closed lid, is the commoner and much to be preferred. In fact, for reasons presently to be stated, mechanical methods are inadmissible in the treatment of glaucoma.

Darier says that although massage renders great service yet it cannot replace operative measures. To a certain extent this is true, but Bradburne's experience of the benefits obtainable by massage have been so very favorable that he would lay it down as an axiom that no case of chronic glaucoma should be operated on until the case has been carefully watched and treated during a period of treatment by massage with, as well, a modified course of myotics.

Drug treatment alone, we all know, will

keep a case of chronic glaucoma under control for years without any need for operation. In time, however, the eye gets used to the drops, and when these have to be made stronger the eye becomes irritated and irritable, which alone may cause a rise of tension. It is particularly under such circumstances that massage is found so peculiarly beneficial in that it assists the absorption of the drugs and by lowering the tension lessens the need for frequent application of the drops.

Operation is primarily resorted to as a precautionary measure to ward off an acute attack in cases of chronic glaucoma, and is of course resorted to for the purpose of reducing the pressure when it has got out of hand. Massage, however, can in a large number of cases do almost as much if properly applied, and as an adjunct to operation is simply invaluable.

Patients who have once thoroughly learned the art of self-massage are in a position to afford us the greatest possible assistance as to progress of the tension during the intervals between their visits to us. They can then tell us of little and unsuspected rises of tension which occur even after the performance of what look like classical operations. Bradburne has operated on cases himself and seen others performed by others which to all intents and purposes were as perfect as could have been desired, and when tested for pressure apparently confirmed this; yet if put through the critical test which auto-massage confers, have been proved to be faulty. Reports received of such lapses soon kill any conceit we might otherwise possess in our operative skill. The confidence begotten by seemingly perfect operative technique has in many cases led to the mistaken diagnosis of the onset of optic atrophy as a result not due to the continuance of the pressure.

Again, auto-massage comes to our assistance in those perplexing cases of quiet glaucoma which in their early stages afford so few objective signs on which to base a definite diagnosis.

Bradburne thinks he has said enough to prove not only the usefulness of ocular massage in glaucoma, but to support his contention that it should form a routine part of the treatment in all cases. He has employed it now for over ten years in all his cases and with invariable benefit to the patient and to himself personally, and in many cases he has used no other remedy.

It now only remains to state the method of application. Bradburne instructs the patient to look well down, to then rest the second fingers of both hands on the center of the eyebrow, and to pass the tips of both ring fingers into the socket right under the orbital plate of the frontal bone until they meet upon the globe of the eye. Both finger-tips must remain in firm contact with the eyeball whilst one finger dimples it, and this will slightly raise the other. By alternately pressing first with one finger-tip and then the other, the intraocular pressure will be felt to diminish. He instructs them to compare one eye with the other or with that of a friend, to massage when dressing in the morning and the last thing before going to bed. If between these periods they perceive a rise of pressure they are to repeat the process during the day, and the oftener they detect a rise the more frequently must it be repeated. They are finally instructed to keep a mental note of the frequency or otherwise of the lapses in the tension, so as to furnish Bradburne with a report of the progress of matters. In cases which seem to require operative assistance he always starts massage within twenty-four hours, gently and at brief intervals and for short séances at first, cutting his suit according to his cloth.

He has seen no untoward results from allowing such liberty to untrained hands. He has seen retinal hemorrhages occur in the course of glaucoma, and has seen them clear up during the process of massage.

Massage is also of benefit in that type which arises in irritative lesions, such as an old case of iritis, or when the eye has at one time been the subject of an injury. The relighting up of the old trouble in such eyes calls for the employment of atropine; this drug leads to rise of pressure, to

counteract which myotics are necessary but tend to lead to congestion again. Under such circumstances the inflammation can be kept in hand by just sufficiently strong solutions of atropine, and the rise of tension combated with massage, which at the same time favors the nutrition of the eye.

THE TREATMENT OF INTRACTABLE PRURITUS ANI BY LOCAL ANESTHETIC METHODS.

GROUND in the *Journal-Lancet* of April 15, 1916, states that Unna declares that itching results from an irritation of the free nerve-terminations in the blood capillaries in the papillary layer of the skin. In order that itching occur, there must be papillæ containing blood-vessels and a horny layer above; otherwise there is no pressure on the vascular papillæ. Whenever the pressure of the horny layer increases along with the capillary pressure, itching follows. Hence there is itching in dry eczema, lichen and prurigo papules, and incipient folliculitis and furuncles. Simple thickening of the horny layer, without increased capillary pressure, does not alone entail itching. But when the temperature changes, and thus a change in the capillary pressure is brought about, the region may itch. Anemic surfaces never itch.

There is in pruritus ani and vulvæ the very acme of conditions to produce itching of the most tenacious and severe kind. The cutaneous horny layer has become thickened from prolonged blood disturbances of its blood-supply and from contracture of the musculature of the skin; and it exerts great pressure, especially when you take into consideration the paralyzed condition of the vascular walls, with excessive inflow and stasis, hyperemia.

From the foregoing it can be readily seen that the fundamentals to be met in the treatment of pruritus are to diminish the blood-supply and to desensitize the terminal nerves in the capillaries of the skin. These indications are fully met by the use of the double salt of quinine and urea. In addition to the prolonged anesthetic effect of the quinine, it has a decided tendency to restrict the circulation distal to the point of injection. This faculty of diminishing blood-supply was determined by Hertzler to be due to a pure fibrinous exudate forming around the vessels and occluding them by pressure from without. The amount of this fibrous exudate depends almost entirely upon the strength of the solution used. This exudate does not appear with a solution of 0.25 per cent or less, but with 0.5 and 1 per cent it is usually very pronounced. This fibrinous induration is particularly noticeable where the solution is made with plain sterile water instead of physiological salt solution. The stronger the solution the greater the exudate and subsequent induration, until the point is reached where sloughing will occur, as Ground can testify. This interference with the circulation is what makes this quinine salt undesirable as an anesthetic where primary union is expected; for, if used in a strength where it is effective as an anesthetic, it does interfere with the best healing.

Several hours after the bowels have been thoroughly evacuated by a mild laxative the anal region is disinfected, preferably with McDonald's pyxol solution. A preliminary injection of cocaine and adrenalin or novocaine is made endermatically. The point of insertion is usually about an inch from the anal margin on a line with the tuberosity of the ischium. This prevents, to a considerable extent, the burning sensation that accompanies the injection of the quinine. The needle is then entered at the point of previous injection, and directed subcutaneously toward the midline back of the anus, depositing a drachm of 1-per-cent solution as the needle is pushed along. The needle is withdrawn and the syringe refilled if it is a small one, and reinserted at the same point and directed laterally about an inch from the anus, and pushed forward toward the perineum, injecting as we advance. Another injection is made until the needle with the finger in the anus can be felt under the mucous membrane, but be sure not to puncture through. While the needle is in this position it is partially withdrawn, and

thrust around the anal margin just under the mucous membranes well to the raphe. Be careful not to inject into the anal sphincter, as a rectal incontinence might occur that would be unpleasant for a few days, for, be it remembered, local anesthesia produces as much, if not more, muscular relaxation than general anesthesia. Of course the injections are made on both sides. Injections are to be subcutaneous and not intramuscular.

If the technique has been properly executed, complete relief of from two weeks to a month can be confidently expected. Often with palliative after-treatment the symptoms, except occasionally in a mild form, do not return. But if the pruritus should return the treatment can be repeated. If the second operation is necessary, in addition to the usual injection Ground deposits a syringeful under the ischial tuberosities, for it is from this region that the main nerve supply comes. If the case is very rebellious, he has, at the last treatment, injected alcohol around the paths of his quinine injections, only a drop or two at a point. Alcohol, as we know, has been used very successfully in the treatment of various neuralgias, and Otto May has shown that alcohol produces a real degeneration of the nerve fibers with which it comes in contact.

ANESTHESIA FOR ENUCLEATION OF TONSILS.

In the *Lancet* of April 8, 1916, BLOMFIELD says that, generally speaking, the best method, both for children and adults, consists, he believes, in giving a preliminary dose of atropine, gradually inducing a deep degree of narcosis by a mixture of chloroform and ether, supplemented in some cases by a few minutes of open ether, and in some adults by a very few minutes of ether from a Clover inhaler. There should be no congestion whatever by the time the operation begins, and the atropine prevents any undue mucous secretion. The anesthesia thus obtained generally suffices for the entire operation. When it does not, chloroform is used from a Junker inhaler or the open mask is reapplied. The same extreme degree of narcosis necessary during dissection need not be kept up whilst the bleeding is being stopped, in the cases of operators who prefer to see deliberately to the stopping of all hemorrhage after each tonsil is removed. The fear of a varying depth of narcosis is, he believes, largely a fetish. So long as there is no return to consciousness it is far better that the absolute absence of reflexes kept up during removal of the tonsil should lapse, whilst the hemorrhage is receiving attention, to a condition in which the coughing reflex and the faucial reflex are present. To allow this is, moreover, to minimize the possibility of secondary or recurrent hemorrhage, which is a mischance not to be ignored, at any rate after enucleation in adults of fibrous and adherent tonsils.

The importance of the position of the patient during operation varies completely according to the way in which the bleeding is treated. If, as with some operators, there is constant sponging, the position of the head is a matter of indifference, for no blood is allowed to descend. If, on the other hand, there is no attempt to stop the bleeding or to interfere with it in any way until the operation is completed, then obviously steps must be taken to avoid the possibility of inhalation of blood during removal of the second tonsil. It is better to achieve this by the safety of the position adopted than to have to rely upon a light degree of narcosis permitting coughing—better, at any rate, from the surgeon's point of view. Position, in fact, must be settled entirely in accordance with the operator's convenience, the anesthetist realizing, however, that in some positions, unless there is constant sponging, he cannot with safety provide a deep narcosis. Sitting, or lying with the head on one side, or with the head straight, are equally satisfactory in the case of operators accustomed to the respective positions, but the anesthetist has certainly to vary his practice to suit the circumstances and to keep a keen eye upon the exact extent of narcosis maintained.

THE ANTISEPTIC ACTION OF ETHER IN PERITONEAL INFECTIONS.

In the *Journal of the American Medical Association* of April 22, 1916, SALIBA reaches these conclusions:

1. Ether experimentally and clinically has been proved to have a bactericidal action.

2. In peritoneal infections it is a safe and beneficial antiseptic.

3. The dose of ether instillation into the peritoneal cavity after operation is 1 ounce for a child above four years, and 3 ounces for an adult.

4. Generally no untoward after-effects and complications follow its use.

5. Any possible toxic action of ether on the various body organs is very slight.

OBSTRUCTION OF THE PYLORUS IN INFANTS.

In the *New York Medical Journal* of April 22, 1916, SILL states that in the treatment of this condition the diet should be breast milk from the mother or wet-nurse, dilution of which may be necessary. When breast milk is not obtainable, suitably modified cow's milk may be given every half-hour in very small amounts at first, and the amount increased at lengthened intervals of feeding as symptoms improve, to one to three ounces every three hours. A milk formula, low in fat and low in sugar, should be given in the beginning. The unsweetened evaporated milk, diluted with barley gruel, is best suited for this purpose.

A good formula for feeding vomiting infants is a mixture of barley flour or imperial granum, skimmed milk, and water, in suitable proportions for the age. This should be cooked in a double boiler for thirty minutes. The food thus thickened by means of a cereal is more readily retained.

The stomach should be washed twice daily with normal saline solution, or a weak solution (five per cent) of sodium bicarbonate, the temperature of the water being 110° F.

Small doses of opium and atropine often act favorably in allaying the spasm. The tincture of opium may be given in one-half to one-drop doses three times a day, or paregoric five drops three times a day. Atropine may be found useful in doses of grain 1/800 to 1/500, three times a day. On the whole it is better not to rely too much on drugs, and many cases get well without them.

Posture is important in these cases. The head of the bed should be raised or a pillow placed under the child so that it lies on a marked incline. This decreases the vomiting and aids in the expulsion of gas. After feeding the child must be kept very quiet for at least an hour.

The postoperative treatment, according to Holt and Downes, consists in giving breast milk alternately with boiled water. Three hours after operation, two teaspoonfuls of breast milk are given, followed in one hour by two teaspoonfuls of water. The next day one-half ounce is administered every three hours. In forty-eight hours one ounce is allowed, and at the end of a week the child is taking two to three ounces at a feeding. On the twelfth day after operation the child is put to the breast. If after twenty-four to forty-eight hours there has been no stool, one or two teaspoonfuls of castor oil is given. Colon irrigations of a normal saline solution are given after twenty-four hours, but sooner if there is distention with gas. It is well to allow as much as possible of the saline to be retained and absorbed from the bowel.

Since writing the foregoing Sill has had the opportunity of listening to an article on pyloric stenosis, dealing with the operative treatment, by Dr. William A. Downes, who has now records of over eighty cases operated on, with a mortality of thirty-two per cent. In the last fifty-two cases he has done the Ramstead operation, which consists in simply opening the abdomen and making an incision through the muscular fibers of the pylorus down to the mucous membrane, and then closing up the abdominal wound. This operation can be done in twelve or fifteen minutes, and there

is little or no shock to the patient. The mortality has been only twenty per cent. The old operation of gastroenterostomy took forty-five minutes or longer, and the mortality was much higher.

MAGNESIUM SULPHATE LOTION IN CELLULITIS.

In the *British Medical Journal* of April 1, 1916, MORISON writes that Lieutenant S. A. B. Paymaster has drawn attention to the above in the *British Medical Journal* of March 11. His findings corroborate those published by Dr. Tulloch and himself on the treatment of all septic wounds by this salt. The treatment of erysipelas by magnesium sulphate is of very old standing, and is mentioned in several text-books on surgery published before the dawn of the Listerian era of antiseptic surgery. It was, of course, at that time used empirically; now we know as a result of the researches of Dr. Tulloch that its action is due not only to its hypertonic action on the tissues, but to the power it possesses of inhibiting the growth of streptococci and most of the granulated-negative forms of bacilli found in wounds. He would, however, suggest that the effect of the treatment is very much hastened and more efficacious, and the change of dressing is less frequently required, if a saturated solution of magnesium sulphate with 10-per-cent glycerin is employed. This he has found by numerous experiments gives the best results in septic wounds and infective conditions.

THE TOXICOLOGY OF SALVARSAN.

The *British Medical Journal* of April 1, 1916, admits that the arsenical derivative of benzene introduced for the treatment of syphilis by the late Professor Ehrlich in 1910, and named by him salvarsan, together with its chemical congeners neosalvarsan, invented in 1912, and sodium-salvarsan, in 1913, are now generally recognized as the most rapidly acting and most powerful of the drugs at our disposal for curing that disease. So far as England is concerned, the import of these drugs came to an end with the outbreak of the war in 1914. The result has been that the manufacture of salvarsan has been undertaken there, and the attempt has met with success; the British drug of the same chemical constitution as salvarsan has satisfactorily passed stringent chemical, physical, physiological, and toxicological tests; it has received the sanction of both the Board of Trade and the Medical Research Committee, has been placed on the market under the name "kharsivan," and has been widely employed in that country during the last few months. Most of its users will agree with the opinion expressed by Lieutenant-Colonel Willcox, after the elaborate investigations recorded in his important paper which appears in the *British Medical Journal* of April 1, 1916, that it is "practically identical in its physiological and therapeutic effects with salvarsan." Naturally, however, one may expect to find differences of opinion in England, the more so because "substitutes" that are "just as good" as the original article are looked upon with disfavor. In addition there is an ingrained tendency, which is wholly unjustifiable, to regard German chemists as superior in ability in the manufacture of synthetic drugs. It is therefore highly satisfactory to find a physician and toxicologist with the experience of Lieutenant-Colonel Willcox making so definite a statement in favor of the home-produced drug kharsivan, as the result of experiments made by him.

Salvarsan has always been a drug of the proprietary class, made in an atmosphere of mystery under a patent giving a misleading account of its preparation, produced at a small cost and sold at a very high price. It is, therefore, a matter of no little interest to read the chemical tests for its purity described by Lieutenant-Colonel Willcox. The doses tolerated by various animals have been worked out very thoroughly by Hata, Castelli, and others, for both salvarsan and neosalvarsan. The mode in which the drug acts is implicit in the words "organotropic" and "parasitotropic," and may be illustrated by Ehrlich's experience with the drug atoxyl, the sodium salt of para-aminophenyl

arsenic acid, with which, following Koch, he began to work in 1902. It was found that some varieties of trypanosomes were abnormally resistant to atoxyl or "atoxyl-fast;" while, on the other hand, numerous human beings were abnormally sensitive to its action, so that atoxyl was organotropic—or, more precisely, neurotropic—when administered to them, anchoring itself to the patient's nervous tissues rather than to the parasites infecting him, and producing atrophy of the optic nerve. Ehrlich, as is well known, held strongly to the maxim that drugs act only on the tissues with which they are chemically combined, and illustrated his view by the somewhat coarse mechanical analogues represented in his side-chain theory. There is a tendency on the part of physical chemists to replace his chemical conceptions by physical notions, processes of colloidal precipitations, alterations in the permeability of cells or cell membranes, and changes in surface tension or absorptive power. The two methods of explanation, however, are not incompatible in essence, and both depend in the last resort upon Ehrlich's fundamental principle, expressed sententiously enough in his aphorism, *Corpora non agunt nisi fixata*—"substances act only when combined."

Lieutenant-Colonel Willcox gives an admirable account of the toxic and even fatal symptoms that may result from the exhibition of salvarsan or kharsivan. As he points out, the pathogenesis of many of the fatal accidents is still obscure. They are not to be explained by anaphylaxis, and to refer them to "a profound autointoxication such as occur in uremia" does little to explain their occurrence. It is interesting to learn that the central nervous system is here found to be almost free from arsenic, the inference being that the death was not caused by the action of arsenic as such upon the brain or cord. It appears that the arsenic accumulates in the abdominal viscera for the most part, and to a less extent in the muscles and blood.

Professor Ehrlich himself was inclined to attribute death from salvarsan to excessive vasodilatation, as will be seen by reference to a letter he sent to the *British Medical Journal* in 1914; and for the treatment of the dangerous symptoms that may make their appearance after injection of the drug he recommended the immediate and repeated administration of adrenalin. He believed that even the extreme cerebral vasodilatation implied in the term "hemorrhagic encephalitis," with its subsequent cerebral edema and circumvascular hemorrhages, might yield to the prompt exhibition of adrenalin, the patient recovering even from a condition of coma.

From the practical point of view perhaps the most important part of Lieutenant-Colonel Willcox's paper is that in which he gives an account of the modes of administration of salvarsan and neosalvarsan, and the methods to be employed in combating the unpleasant symptoms, mild or severe, that may follow its use; for it is likely that these drugs will soon be employed in increasing quantities, now that the report of the Royal Commission on Venereal Diseases has been published. The dwellers in towns and cities, who are the chief victims of syphilitic infection, will no doubt receive the advantage of increased facilities for the diagnosis and treatment of their disease, because the Commission urges the necessity of encouraging existing institutions to bestir themselves in this direction, and recommends that they should be subsidized for the purpose from both imperial funds and the local rates.

ACID AUTOINTOXICATION IN INFANCY AND CHILDHOOD.

In the *Boston Medical and Surgical Journal* of April 20, 1916, MORSE writes on this important topic. He points out that the cause of the symptoms in acid intoxication being the withdrawal of bases from the organism as the result of an excess of acids in the system, it is evident that the treatment indicated is the introduction of alkalies into the system to neutralize the acids in the body, in this way preventing the further withdrawal of bases from the body and allowing the reaccumulation of the

bases which have been abstracted from the body. The best alkali to use is the bicarbonate of soda. This may be given by the mouth, by the rectum, subcutaneously, or intravenously. It is preferable to give it by the mouth if it can be retained. It is best given in water, but if desired the taste may be disguised by orange juice or grape juice. It is seldom wise to make the concentration of the solution stronger than 1:20. It is usually better to make it 1:30 or 1:60. Stronger solutions are almost certain of themselves to cause vomiting. The general feeling is that as much soda should be given as possible. It is very probable, however, that excessive amounts of soda may of themselves cause vomiting and diarrhea, and perhaps poisoning.

Morse is very confident that in a considerable number of instances in which he has been called in consultation to see cases of supposed "acidosis," the vomiting and diarrhea were the result of excessive doses of bicarbonate of soda and not symptoms of acid intoxication. In one instance of which he knows, in which a baby of fourteen months received three ounces of dry bicarbonate of soda in twelve hours, the baby was collapsed and almost moribund, apparently as the result of the large amount of soda. Other alkalies may be used, but are, as a rule, not as satisfactory as bicarbonate of soda.

Bicarbonate of soda should also be given by the rectum. The solution may be stronger when it is given in this way. The solution is more often retained when it is given by seepage than by enema. Seepage is, in Morse's experience, the more satisfactory method. The solution used for seepage should ordinarily not be stronger than 1:10. It is, of course, useless to attempt to give soda by rectum when there is diarrhea.

When bicarbonate of soda is given subcutaneously, a 2-per-cent solution should be used. When given intravenously, a 4-per-cent solution is strong enough. The amount to be given must depend, of course, on the age and size of the patient.

The acetone bodies being formed chiefly from fat in the absence of carbohydrates or when there is a disturbance of the carbohydrate metabolism, another indication is to administer an easily absorbable and utilizable carbohydrate. Such a carbohydrate is glucose or dextrose. This may be given by mouth or by rectum. It is usually advisable to give the soda, both by mouth and by rectum, in a 10-per-cent solution of dextrose. In urgent cases dextrose may be given intravenously in the strength of 2½ per cent of dextrose in normal saline solution. Kahlbaum's is the only readily available pure dextrose. When the vomiting stops and the patient begins to improve, the carbohydrates may be added in the form of the cereal waters or jellies, to which one of the various maltose-dextrin mixtures or lactose may be added.

Practically, the usual treatment is the administration of a 5-per-cent or 10-per-cent solution of bicarbonate of soda in a 10-per-cent solution of dextrose freely, both by mouth and rectum. In Morse's experience the immediate and thorough cleaning out of the intestinal tract has seemed to have more effect on the outcome in these cases of acid intoxication secondary to infections or to diseases of the intestinal tract than any other single procedure.

It must be remembered that this treatment is simply for the condition of acid intoxication, and that this condition is not a primary but a secondary one. Therefore, even if the condition of acid intoxication is relieved, the original causative disease remains. The patient may die, therefore, even after the acid intoxication is cured.

THE HARRISON LAW AGAIN.

The *Official Bulletin of the Chicago Medical Society* of April 15, 1916, contains a second report on the so-called Harrison Law governing the sale of narcotics. Since the publication of an earlier report of this committee there have been published additional decisions of importance.

It will be remembered that several District Courts decided that the clause "any persons" in section 8 should be interpreted

as limited to those specified in section 1 as required to take out licenses. This seems a reasonable interpretation, but the Circuit Court of Appeals of the Second Circuit, New York, gave a reverse interpretation in Wilson *v.* United States (229 Fed., 344). This must, therefore, be considered law until it shall be reversed by the Supreme Court, or is made doubtful by a reverse decision in another Court of Appeals. According to this, the having in possession of cocaine, morphine, etc., by an unlicensed person, unless it shall "have been prescribed in good faith by a physician, dentist, or veterinary surgeon registered under this act," must be considered "presumptive evidence of a violation" of the act; and a physician, dentist, pharmacist, or veterinarian who aids a person to thus acquire possession of the articles specified in the act may be punished either under this act or under the general code prohibiting the aiding of others to violate the United States statutes.

As to the meaning of the expression "in good faith," certain Federal and State decisions must be considered.

In U. S. *v.* Custis (229 Fed., 288) the District Court for the Western District of New York said: "A physician who issues a prescription for an unusually large amount of the drugs, which prescription shows on its face that the quantity prescribed is unreasonable and unusual, or a dealer . . . is guilty of an offense, unless the prescription indicates the necessity for such unusual quantity." In a case of cancer, therefore, for example, where an unusual amount is prescribed, in self-protection the physician should make mention of the fact in his prescription.

The regulation of the practice of medicine comes under police power, and as such is within the province of the individual States, not within the province of the national government. For this purpose the definition of professional practice may be broader in the State law than the nation is obliged to recognize. This is set forth in the decision of the District Court in Tucker *et al v.* Williamson (229 Fed., 201), which said: "Under the general code of Ohio, a person who examines patients, diagnoses their diseases, and then prescribes and sells his own proprietary remedies, is engaged in the practice of medicine, although his ostensible and apparent motive may be the sale of his medicines, and he is subject to the laws of the States regulating such practice.

"The provisions of the Harrison Act, December 17, 1914, exacting a license as a condition for the sale, dispensing, or distribution of drugs are not an exercise of police power, but are for the purpose of revenue, and such license is a mere form of imposing a tax, and implies nothing more than that the licensee shall not be subject to the penalties of the act.

"While the Harrison Act permits a physician in the course of his professional practice to dispense and distribute the mentioned narcotics to a patient by whom he is employed to prescribe without being subject to the prescribed regulations, although he does not personally attend such patient, the act must be construed with reference to the known usages and modes of practice in the profession, in which the prescribing for patients without personal examination is the rare exception and not the rule, and under the provision of section 1, requiring the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, 'to make all needful rules and regulations for carrying the provision into effect,' the Commissioner has authority to prescribe what shall constitute 'personal attendance' by a physician within the meaning of the Act, and a regulation which denies the right of registration and exemption to one who, although a licensed physician, does not see most of his patients, who bases most of his prescriptions on their own written statements sent to him through the mails, and who prescribes the same remedy for all alike, is within the power conferred and is valid."

The Tennessee law is modeled after the Harrison Act, and closely conforms to its provisions. One Dr. Hyde, of Nashville, was asked by a detective to give him a

prescription for a friend, one "Louise Walker," living at a certain address. He gave the prescription and it was filled at a drug store. In fact, the person and address given were fictitious. Dr. Hyde was prosecuted for violation of the statute (Hyde *v.* State, 174 S. W., 1127). He appealed to the Supreme Court for arrest of judgment, on the ground that the act was a regulation of practice of medicine. The court held that it did not regulate the practice of legitimate medicine, but it was a regulation of the sale of habit-forming drugs (see also State *v.* Woolen, 128 Tenn., 487; 161, S. W., 1006). Secondly, Hyde claimed that in so far as the law required him to be in personal attendance, it violated the State constitution, in that it arbitrarily curtailed his right to practice by methods formerly obtaining. The court, however, agreed with other courts to the effect that laws restricting the sale of habit-forming drugs, and prohibiting their sale except on the prescription of a practicing physician, are constitutional. (See Ex parte Hallawell, 155 Cl., 112; 99 Pac., 490.) A physician who aids a person to obtain drugs by giving an illegal prescription thereby becomes a party to the sale, and an accomplice of the seller. (See McLain *v.* State, 43 Tex., Cr. R. 213; 64 S. W., 865.) The fact that the prescription was given at the solicitation of an agent of the State does not absolve the violator of the statute. (See Grimm *v.* U. S., 156 U. S., 604; Goode *v.* U. S., 668; Rosen *v.* U. S., 161, U. S. 29; Excise Commrs. *v.* Backus, 29 How. Pr., 33; Evanston *v.* Myers, 172 Ill., 266; People *v.* Murphy, 93 Mich., 41; State *v.* Lucas, 94 Mo. App., 117.) Finally, Hyde claimed that since Louise Walker was non-existent, there could be no guilt. The court held, however, that if, through the method used, the drugs could come into the hands of habitual users, there was a clear violation. To hold otherwise would be to admit that all that was necessary, in order to evade the provisions of the law, would be to write prescriptions for fictitious persons.

The provisions of the Illinois statute, as found in the pharmacy law, are very similar to the national statute; but it is also provided, section 14b, that: "It shall be unlawful for any licensed physician or licensed dentist, or other person, to furnish or prescribe for the use of any habitual user any of the substances mentioned . . . but the provisions of this section shall not be construed to prevent any licensed physician from prescribing for the use of any patient under his care for the treatment of a drug habit, or dispensing to such patients such substances as he may deem necessary for such treatment: Provided, That such prescriptions and treatment are given in good faith, and not for the purpose of evading the intentions of this act: And Provided further, That such physician shall keep a record," etc.

The penalty for the first offense is a fine of not more than $1000, or imprisonment for not more than one year, or both. The prosecutions are brought by the State Board of Pharmacy, when complaint is made to it. To make the law more efficient perhaps the prosecutions should be put in other hands.

In Chicago *v.* Montgomery (191 Ill. App., 558) it was held that the burden of proof of showing that the sale of cocaine was not unlawful is on the defendant.

Under the terms of this statute it may be questioned whether a physician called upon by a habitual user, or called to prescribe morphine or cocaine for such user, has the legal right to make such prescription, unless the patient is under regular treatment for such habit; and it is the opinion of the committee that such treatment should only be given in such a hospital, or under such other conditions, as will give the physician full control to prevent the drugs being obtained from other sources.

It will be noticed that the requirement as to mixtures which are prohibited or regulated as to sale, making the limit of two grains of opium, or one-quarter of a grain of morphine per ounce, does not prohibit the sale, without special restriction, of paregoric. This does not, however, necessarily indicate that such sales of paregoric are not illegal. The Chicago Code of 1911, section

808, provides: "No druggist or other person shall sell or give away any morphine, cocaine, alpha or beta eucaine, chloral hydrate, or any salt or compound or derivative of the foregoing substances, or any substance, preparation or compound containing any of the foregoing substances, or any of their salts or compounds or derivatives, except upon the written prescription of a duly registered physician." The penalty is a fine of from $50 to $200 for each offense. This would seem clearly to include paregoric, and persons knowing of this violation of this ordinance should assist the prosecution in such reprehensible practice as the selling of this article by the quart by unprincipled druggists.

Under this ordinance Truax, Green & Co. were prosecuted for illegal sales of cocaine. (Chicago *v.* Truax, Green & Co., 192 Ill. App., 524.) It was held by the Court of Appeals that it was no defense that the clerk had previously dealt with the purchaser as a practicing physician and had no knowledge of his habits. In a second case (Chicago *v.* Truax, Green & Co., 192 Ill. App., 528) the court held that: "One selling cocaine on an order is bound to know whether the order relied upon is authentic, and made by a registered or licensed physician as prescribed by the ordinance."

Section 809 of the Chicago ordinances provides that no poisonous medicine, decoction or substance shall be held for sale or sold, except for lawful purpose, and with proper motives, etc., and the next section prohibits the sale or prescription of medicines under a deceptive or fraudulent name.

Physicians must remember that under the general decisions they will be held guilty if they aid in such illegal sales by giving fictitious prescriptions.

It must also be remembered that the United States postal regulations prohibit the sending of poisons through the mails. One Chicago physician unintentionally violated this law by sending morphine through the mail to one of his patients who was dying from cancer.

Finally, because State laws have higher standing than municipal ordinances, it would be well if the State law should be amended to include the sale of paregoric under its restrictions.

HEXAMINE: ITS USE AND MISUSE.

In the *Practitioner* for April, 1916, ERULKAR reaches these conclusions:

1. Hexamine (hexamethylenamine) acts as an antiseptic only in those parts of the body where the medium is naturally acid or can be made acid.

2. Hexamine should be given in neutral or slightly alkaline mixtures, and if acid sodium phosphate is necessary to render the urine acid, it should not be combined with hexamine in the same mixture, but there should be an interval of one or two hours between the administration of these two drugs.

ACUPUNCTURE AS A THERAPEUTIC PROCEDURE.

The *New York Medical Journal* of April 15, 1916, reminds us that it not infrequently happens that some therapeutic procedure which has survived from an earlier medical generation on a purely empirical basis is finally proved to have real scientific merit. Again, such procedures sometimes survive because in spite of failure to establish an experimental scientific basis the results are so evidently efficacious that their empirical employment stands justified. If these two facts are found in the realm of our own therapeutic inheritance, they may well be kept in mind in the consideration of empirical therapeutic agencies of wide and ancient usage among foreign races.

Lacking means for the control of pain and hemorrhage, surgery has made no progress in China. The Chinese division of medicine into external and internal diseases led to two types of curative efforts. One type consisted of the development of a large materia medica in which are many drugs used in western practice, and perhaps some drugs having new potent principles, or at least new sources of known principles. The second type consisted of the develop-

ment of the system of acupuncture, which has been frequently described and as frequently derided. Yet analogy will show that so wide-spread and persistent a clinical practice probably has some element of value, which, although empirical, is none the less deserving of study.

According to Cadbury (*China Medical Journal*, xxvii, 375, 1914), 388 points are described as suitable for acupuncture, and the practice rests on the theory that puncture of the vessels connecting the different organs will abort disease. Careful observation of the practice has seemed to show that it has a certain value in relieving pain by counter-irritation and in relieving stiffness and swelling under certain conditions. J. Cantlie, in an editorial article in the *Journal of Tropical Medicine and Hygiene* (xix, 46, 1916), records some personal experiences with this method of treatment, and has found it of real value in a variety of conditions such as so-called rheumatic pains in the gluteal region, hip, and lumbar muscles, swelling and pain following minor injuries to joints, and sciatic pain where no cause is found. He suggests that not only does acupuncture or needling have a counter-irritant effect, but it also pierces and relieves local edema and congestion, especially under fascia. He cites the Chinese use of two coins between which the skin is nipped as another effective mode of counter-irritation.

As Cantlie points out, hepatic puncture in the effort to locate abscess often shows no pus, but nevertheless causes improvement and sometimes seems to lead to cure, by local depletion and relief of tension. Where the lung has been pierced, instead of dangerous symptoms, we find that the associated deep congestion of the lung is greatly relieved. Cantlie has found clinical justification for acupuncture in a limited group of cases. He presents the subject "to bring up for discussion a practice which has tradition—that is, experience—for its justification; and there can be no doubt that as a rational treatment it has much to commend it."

This seems to be a matter which deserves further study, and it might well yield a new clinical procedure which has so far been employed only tentatively and spasmodically.

TREATMENT OF TOXEMIA OF PREGNANCY.

The *Journal of the American Medical Association* of March 25, 1916, contains an article by IRVING in which he states that, in general, the treatment at the Boston Lying-in Hospital has followed certain definite lines, although not all members of the staff in the past have by any means concurred in the ideas here expressed. All patients in the pregnancy clinic showing albuminuria or a blood-pressure above 130 are at once put on meat-free diet with restricted salt and forced fluid. The patient is directed to take large doses of magnesium sulphate and to return to the clinic in a few days. Should evidence of toxemia develop, she is admitted to the hospital, where she is put to bed and the same treatment more vigorously carried out. Should her condition grow worse or fail to improve, the majority of the staff terminate pregnancy without waiting for convulsions to occur. In the past, however, eliminative treatment has occasionally been carried beyond this point, not always with favorable results.

Eliminative treatment alone was successful in twenty-nine of fifty-eight cases. The process quieted down, and pregnancy was allowed to continue or labor ensued. In eleven cases labor was induced by Voorhees' bags, which acted satisfactorily in nine.

One patient died undelivered after eliminative treatment. A second died after a five months' spontaneous miscarriage, and the third after a full-term normal delivery. Although nine eclamptics is too small a number on which to base any conclusions, it is quite evident that none of the women who were lost died as the result of so-called violent operative delivery.

1. In 80 per cent of pregnant women the blood-pressure ranges from 100 to 130.

2. In 9 per cent the blood-pressure may be below 100 once or more. A blood-pres-

sure below 90 does not mean that the patient will have shock unaccompanied by hemorrhage at the time of confinement.

3. In 11 per cent of cases the blood-pressure may be above 130 once or more. Age, nationality, and parity seem to have some influence on blood-pressure. High blood-pressure in the young is more frequently a sign of toxemia than in those over 30.

4. Elevated blood-pressure is more commonly an index of toxemia than is albuminuria, and is apt to be an earlier sign. The degree of elevation points more surely to the likelihood of toxemia than does the degree of albuminuria. Both, however, are of the utmost importance.

5. Isolated cases of elevated blood-pressure unaccompanied by albuminuria or evidences of toxemia occurred not infrequently. Usually they responded to free catharsis. Some pressures remained elevated in spite of treatment, and apparently were normal, during pregnancy at least, for the patients who exhibited them.

6. A progressively rising blood-pressure, often from a low level, even though it never reaches the arbitrary danger-point, should be regarded with apprehension as a most valuable sign of approaching toxemia.

7. Toxemia is much more common with a blood-pressure above 150 than it is below that point.

8. Most cases of eclampsia occurred with a pressure of 160 or more. Eclampsia may, however, occur with a pressure of only moderate elevation.

9. All toxemics developed both albuminuria and elevated blood-pressure.

10. While the incidence of eclampsia in this series is about the same as the figures usually given, it is significant that two-thirds of the patients who developed convulsions absolutely neglected advice and refused to return to the clinic. Had these patients been discharged against advice during pregnancy for disobeying instructions, very favorable statistics would have been obtained. The hospital feels that it would be most unjust to the ignorant foreigners, who constitute the vast majority of its patients, to desert them when they most need skilled hospital care. With proper coöperation from the patients, and eliminating the fulminating cases which develop in a few hours, there is no doubt that eclampsia should be practically a preventable disease.

SUGGESTIONS WITH REGARD TO A RATIONAL EMETINE THERAPY.

The *Archives of Internal Medicine* of March 15, 1916, contains an article by LEVY and ROWNTREE in which they ask and answer the following question:

How may the toxic effects of emetine best be avoided? As the result both of clinical and laboratory observations the following suggestions are presented:

1. The administration of emetine hydrochloride is not to be regarded as a harmless procedure. Even in therapeutic doses ill effects may follow its use.

2. Individualization by close clinical observations is essential both for the success and safety of the treatment. Patients may differ markedly in their susceptibility to the drug, and the various commercial preparations vary widely in toxicity. These points are strikingly demonstrated by the toxicity experiments reported by the writers.

3. The treatment should be given in courses, at intervals of several days or a week. The subcutaneous route is the one of choice. Individual dosage and the duration of each course must be determined by the exigencies of the case. One-third grain three times a day for a week or ten days is usually a safe dosage in amebic infections. It is rarely necessary to give more than 1½ grains daily. In the treatment of pyorrhea, Bass and Johns advocate ½ grain daily for from three to six days, and maintain that no case need have more than six days' treatment. Under ordinary circumstances this seems well within the margin of safety. It must be borne in mind, however, that the administration of even relatively small doses over a long period of time may prove harmful.

4. The large dosage advocated by Baer-

mann and Heinemann is unnecessary and dangerous.

5. Intravenous injections should be employed only in extreme cases. If this mode of administration seems imperative, small doses, well diluted (½ grain in 100 Cc. salt solution) should be slowly given, and the blood-pressure should be carefully observed during the injection.

BERIBERI, WITH SPECIAL REFERENCE TO PROPHYLAXIS AND TREATMENT.

WILLCOX in the *Lancet* of March 11, 1916, states that absolute rest in bed is essential in the early stages and in all cases showing cardiac symptoms.

In an acute case, in which gastric symptoms are marked, the diet will necessarily be light and mainly liquid.

Yeast should be given. Two ounces of dried yeast, such as is supplied on campaign under the name of "export yeast," should be administered daily. This is conveniently given by pouring on the yeast a little boiling milk, stirring up into a thin cream, and then adding more warm milk and sugar, so that a palatable food results. In place of export yeast, cakes of dried yeast mixed with a little starch are often available. These are supplied under the name of "Royal yeast cakes," which are like small biscuits weighing about ½ ounce each. Six of these should be given daily. The following was found a convenient and palatable method of preparing the yeast cakes for consumption: One or two yeast cakes were placed in a basin, boiling milk was poured on them, and the cakes broken up and rubbed round with a spoon into a thin cream. Then warm milk and sugar were added, and the mixture was then ready for taking.

If neither of the above forms of yeast is available on campaign, yeast can always be obtained from the army bakeries, where yeast brews are constantly kept going. The yeast obtained here will be mixed with the liquid of the brew. About half a pint of this should be taken daily. It may be sweetened with sugar and flavored with lemon rind or essence of lemon. It is quite palatable.

Pea soup is a useful article of diet. the pea powder containing anti-beriberi vitamines. Three or four raw eggs should be given daily, beaten up with milk, or taken in any other way.

The above dietary is rich in anti-beriberi vitamines, but a valuable addition to it will be fresh lemon-juice—*e.g.*, the juice of two or three lemons per day. This will contain anti-scorbutic vitamines, which are often needed by beriberi cases, owing to the close association etiologically between beriberi and scurvy.

When the patient can take solid food, in addition to the yeast, which is very essential throughout the disease, the following articles of diet may be given. They are arranged in order as regards their value from the quantity of essential vitamine present, those highest in the list being rich in vitamine.

Articles of Diet for Beriberi Cases, Arranged in Order as Regards Vitamine Value.

1. Yeast (already mentioned).
2. Eggs (either raw or lightly cooked).
3. Brain.
4. Liver.
5. Sweetbread
6. Kidneys.
7. Heart muscle.
8. Peas.
9. Haricot beans.
10. Katjang idjoe beans.
11. Lentils.
12. Porridge.
13. Brown bread.
14. Milk (fresh if possible).
15. Fish or meat.
16. Ordinary bread or biscuits.

Lemon-juice or lime-juice should also be given.

Extracts of yeast are on the market. These taste exactly like extract of meat, and when mixed with warm water form a drink like ordinary meat extract or bovril. Yeast extracts may be given with advantage in beriberi cases, both acute and chronic.

Fresh vegetables, fruit, and, generally speaking, an ample dietary should be given in beriberi cases in which there is no gastric disturbance.

The symptoms of beriberi call for special treatment. The cardiac symptoms will require treatment by means of cardiac tonics—*e.g.*, digitalis, strychnine, strophanthus, etc. In severe cases strychnine and digitalin may be given hypodermically, and oxygen. Oxygen passed through absolute alcohol is

valuable. The multiple neuritis calls for treatment on the usual lines. Light massage, electric treatment by the galvanic current, etc., are valuable.

THE TREATMENT OF DIPHTHERIA CARRIERS WITH IODIZED PHENOL.

The *Journal of the American Medical Association* of March 11, 1916, contains an article by OTT and ROY in which they state that in all cases reported iodized phenol (acidum carbolicum iodatum) of the National Formulary was used. It contains 60 per cent phenol (carbolic acid), 20 per cent iodine crystals, and 20 per cent glycerin. In pharyngeal cases the tonsils, uvula, and posterior wall of the pharynx were swabbed every forty-eight hours until negative cultures were obtained. In nasal cases the entire anterior part of the nasal cavity was swabbed with iodized phenol every forty-eight hours. Care was taken not to allow the preparation to run over the face or drop into the larynx. Cultures were always made a few minutes before the local application. In this way, forty-eight hours elapsed after each application of iodized phenol before another culture was made.

Seventeen cases were treated. Negative cultures were obtained after one application of iodized phenol in six cases (35 per cent); after the second application in five cases (29 per cent); after the third application in two cases (12 per cent); after the fifth application in one case (6 per cent). One case (nasal) was under treatment for twenty-one days and required nine applications before negative cultures were obtained. With the exception of this case, none of the other sixteen were under treatment longer than eleven days.

Fifteen of the cases were followed after leaving the hospital, and negative cultures obtained in all. No treatment had been used since the discharge of the patients from the hospital, and all of them had been out from one to three weeks when these cultures were made.

No bad results have been noticed from the use of this rather strong preparation in the nose and throat. The application is painful for half a minute or less until the anesthetic action of the phenol takes effect. There is a thin eschar formed at the site of application which remains for about twenty-four hours. This disappears entirely within forty-eight hours after swabbing, leaving the throat red for a few days. After the redness disappears the throat returns to normal. This was true in the thirteen patients whose throats were examined from one to three weeks after leaving the hospital. The throat, in each case, was found to be as normal in appearance as before treatment was begun.

The manner in which this preparation acts in ridding the throat of diphtheria organisms so promptly, Ott does not know. It has been proved by Albert that the bacteria in carriers are harbored in the crypts of the tonsils and are not on the surface of the mucous membrane of the nasopharynx. Kretschmer cured carriers by squeezing the crypts of the tonsils. The phenol in the preparation undoubtedly destroys the outer layers of the epithelium. It probably does not reach the organisms in the crypts, but it may permit the more thorough penetration of the iodine. In this way the iodine may reach and destroy the harbored organisms with more certainty than it does when applied alone.

MIGRAINE.

In the *New York Medical Journal* of March 25, 1916, REMY, in writing on this subject, says that to attribute the phenomena to intermittent nasal obstruction is both simple and more scientific, especially as it can actually be demonstrated during the life of the patient. This theory explains all of the various symptoms, the connection between which has never before been even remotely understood.

Pressure upon the sphenopalatine ganglion, caused by swelling of the mucosa of the middle turbinate impinging against a relatively high deviation of the nasal septum, by disturbance of the local circulation, ends in a reflex spasm of the cerebral

vessels, which accounts for all the remote symptoms, to wit, the vertigo, nausea, vomiting, dulness, oppression, etc., which appear in turn. Once this etiology is grasped, it becomes clear why the affection comes on about the age of puberty, for it is then that the nasal septum begins to bend from pressure upon it by the faulty development of the facial bones. The disproportionate growth of the frontal and maxillary bones causes the vomer to yield. Any one conversant with the anatomy of the nose may now readily see why migraine is sometimes double, because the septum may be so thickened as to obstruct both nostrils, and consequently compress both ganglia at the same time, or it plugs the nostril posteriorly, resulting in occipital migraine. Thus also is made clear the reason for the spontaneous cessation of the disease late in life when the nasal mucosa is no longer erectile.

Apart from the nasal obstruction there are undoubtedly other contributing factors, such as vasomotor disturbance, which causes the flushing of the face, chilly sensations, and later pallor, which are usually present. Heredity plays its rôle in the sense that the bony configuration of the nose is inherited, and also the tendency to the same form of deviation. A neurotic element alone can account for the fact that many septums are deviated, but relatively few people are affected with migraine. The converse, however, that there is no migraine if the septum is normal, will invariably be found to be the case, and serves as a means of differential diagnosis when the headaches are due to other causes.

Needless to say, in the great majority of cases the deviation is of slight extent, includes the upper third of the septum, and is often situated fairly far back in the nose. The convergence of the bony walls of the nose above allows a relatively small deflection or thickening to cause marked obstruction when the mucosa swells. During the intervals of the attacks practically no disturbance is felt by the patient in most cases, and only a painstaking and thorough examination can determine its existence in some patients.

In the presence of the attack of migraine no difficulty will be found in demonstrating the swelling of the membrane and the resulting contact and compression. Many sufferers spontaneously complain of the nasal obstruction, and speak of the "stuffiness" in the head and nose. But, as will be readily understood, the reason this symptom is not more often elicited is that the pain naturally overshadows all the other subjective features, and in the intervals the obstruction is not usually of sufficient degree to attract the attention of the patient.

The nasal obstruction is at times so marked as to cause an almost incredible resistance to the passage of a cotton-wool probe. The extreme tenderness over the posterior part of the middle turbinate and the region of the sphenopalatine ganglion is highly suggestive in these cases.

The intermittency of the attacks, so characteristic of the disease, can be explained only by the erectility of the mucous membrane of the "swell bodies," which, by their susceptibility, react to stimulation by atmospheric conditions and barometric changes. Thus it is that foul air, sudden changes of temperature, irritating vapors, and even tobacco smoke may act as stimuli.

Cocaine solution upon the swollen mucous membrane, by shrinking it, gives almost instantaneous relief from the headache, but the pain comes back as soon as the effect of the medicine passes off. Some authors have held that this relief is due to the analgesic effect of the cocaine; therefore adrenalin solution was substituted and found to have the same power. This experiment clearly demonstrates that the swelling of the nasal mucosa and the resulting pressure on the nerves and ganglion are the determining factors in the pathology. Drugs, such as potassium bromide, in massive doses, which reduce cerebral congestion, are capable of modifying the symptoms.

The treatment is clearly indicated once the cause is known. The thorough and complete submucous resection of the nasal septum alone can cure true migraine. It is of the utmost importance to bear in mind

the true pathology, because if the resection is not properly done some points of contact may be allowed to remain and so render ineffective the operative interference. No amount of tinkering with the turbinates can do more than relieve, somewhat, the trouble. And this is true because while the mucosa is active, a secondary hypertrophy may occur after the removal of the middle turbinate; or a compensatory overgrowth of the superior turbinate may follow operation on the one below.

The thorough extirpation of all the bony defect of the septum, however, with due care to avoid perforation, which is of importance in these cases, will give prompt and complete relief, because no amount of swelling of the middle or superior turbinate can then cause pressure, as there remains only the resilient membranous partition after the resection, which yields to their increase in volume. The beautiful plates of Deaver's Surgical Anatomy show in detail the relation of the sphenopalatine ganglion to the posterior extremity of the turbinates, as well as the distribution of the nerves in the turbinates and septum.

INTRAMUSCULAR INJECTIONS OF MERCURY SALICYLATE IN THE TREATMENT OF SYPHILIS.

Writing in the *Medical Record* of March 11, 1916, BEST states concerning the inconvenience to the patient from the intramuscular injections of mercury salicylate that he thinks this is largely a matter of technique. While it is impossible to make the injections absolutely painless, the soreness experienced and the induration produced can be reduced to a minimum by being certain that none of the suspension of the drug is permitted to enter the adipose tissue. Best noticed when he first used this method of treatment that women are more inclined to suffer soreness and induration than are men. After some pondering of this, he concluded that it was probably due to the fact that women as a rule have larger deposits of adipose tissue about the buttocks, and that in all probability his injections were being made into the fat rather than into the muscle.

That there was some basis of fact in this conclusion was proven when subsequently he used a longer needle (2½ inches), and much of this soreness and induration was obviated. As a further precaution he withdrew the needle quickly, immediately put pressure over the site of the injection, and massaged deeply but gently for a few moments. This prevents the suspension from leaking back along the track of the needle and thereby getting into the adipose tissue. The patient is instructed, should any undue tenderness or induration occur, to take a hot sitz-bath for ten or fifteen minutes each night before retiring, and massage the area gently all the while; this to be continued until the soreness remits. That this technique is fairly satisfactory is proven by the fact that Best numbers among his patients men who earn a living by driving trucks about the city streets, and he would think with them the soreness incident to the injections would be most felt. Yet these patients have complained of but little inconvenience, and have not found it necessary to lose any time from their work.

Taking into consideration all the factors *pro* and *con* in the various forms of mercury treatment, Best thinks the intramuscular injection of mercury salicylate offers the most convenient, most easily controlled, most efficient, and most satisfactory of any of them.

THE CONTROL OF DIPHTHERIA EPIDEMICS.

STOVALL, writing in the *Journal of the American Medical Association* of March 11, 1916, states that the whole subject of the control of epidemics of diphtheria may be briefly summarized as follows: Methods commonly employed in the fight against diphtheria are not adequate; Schick's test requires no special technique that cannot be easily developed by any physician, and, therefore, is available to all; Schick's test is a prompt, economic, and satisfactory method of quelling epidemics of diphtheria, when used together with swabs.

THE CONSERVATIVE TREATMENT OF THE TONSILS.

In the *New York Medical Journal* of March 11, 1916, HUDSON-MAKUEN writes an important paper in which he says it is a recognized fact that, while the removal of the tonsils renders attacks of tonsillitis and pharyngitis less severe, it does not insure the patient against recurrence. A tonsillitis, in the majority of instances, is not a local disease, but merely an expression of a systemic condition, and for all we know the tonsillitis may be an expression of nature's method of combating an untoward systemic condition, and to remove the tonsil may be like killing the goose that lays the golden egg.

A mere tonsillitis, therefore, or even recurring attacks of tonsillitis, may not be and are not an absolute indication for the removal of the tonsils, and to regard it as such would be something like advising the removal of the entire pharyngeal walls to insure against a recurrent pharyngitis.

Among the most valuable and important of the conservative measures for the treatment of diseased tonsils are those employed to improve the drainage of the tonsillar region, and this is done by opening up retention pockets, whether they are found in the crypts of the tonsils themselves or between the tonsils and the adjacent faucial pillars. It frequently happens that certain of the tonsillar crypts drain into one of these cicatricial pockets, and thus is formed a veritable cesspool of infection.

Sometimes a very slight operation will serve to open the pocket, give the desired drainage, and thus remove a serious and constant source of infection. Makuen might say that the most satisfactory work that he has done with the tonsils is along this very line. It is scientific, because it carries out one of the great principles of surgery, namely, drainage.

The details of the work or the technique he has described elsewhere, and it consists, briefly, in laying freely open the retention pockets, or cysts they may be, with suitable knives such as Makuen devised for this work twenty years ago, and such similar ones as have been devised by many others before and after his own were made.

One trouble about the operation is the fact that the cut edges tend to unite after a few days, and thus a new pocket may be formed, but Makuen has obviated this by freely burning the edges with the actual cautery or with some chemical cautery, such as a saturated solution of chromic acid applied with an applicator carrying a bit of absorbent cotton. Cutting or punch forceps have been recommended for the opening of these retention pockets and retention crypts, very good ones being devised by Freeman. These instruments remove a small section of the wall of the pocket or crypt, and thus render less liable a reunion of the parts.

It is Makuen's earnest conviction that the faucial tonsils rarely become foci of serious general infection, and in the great majority of instances, where the radical operation is done, complete and permanent relief may be obtained for the patient by the conservative measures such as he has described. He is well aware, however, that this complete and permanent drainage cannot be secured in all cases, chiefly because of the depth to which some tonsils are buried in their fossæ and the constriction with which they are surrounded and held by the palatal pillars and a large and obstructive plica triangularis.

ELECTROCARDIOGRAPHIC STUDIES OF PATIENTS UNDER DIGITALIS TREATMENT.

In the *Boston Medical and Surgical Journal* of March 9, 1916, STEVENS reaches these conclusions:

1. The cases in which digitalis produces marked slowing of the heart are cases of abnormally rapid rate; the drug in ordinary doses appears to have little or no effect upon rates which are normal. The ventricular slowing may be produced in cases of normal auriculo-ventricular sequence and in cases of auricular fibrillation and auricular flutter.

2. In some cases of normal rhythm under

digitalis treatment there is a distinct increase in the P-R interval; and an accompanying increase in the R-T interval. In some cases of fibrillation also the increase in the R-T interval is found. In most instances these increases are coincident with a decrease in the rate and hence accompany an increase in the length of the whole heart cycle. A possible factor in the improvement of the heart's action under digitalis may be the increased mechanical advantages resulting from the increase in the total length of the cardiac systole.

3. Transformations in both P and T waves appear coincidentally with and are apparently related to the digitalis treatment. These variations are, however, not constant.

4. A single case in which digitalis coupling occurred shows, in all instances of the extra systoles, complexes of the same type, indicating a common focus of origin.

5. A single patient showed a much increased susceptibility to slowing by vagus pressure during the digitalis treatment.

THE ACTION OF DRUGS ON THE URETER.

In the *Journal of Pharmacology and Experimental Therapeutics* for February, 1916, MACHT states:

1. A ring of pig's ureter suspended in oxygenated Locke's solution at 37° C. begins to contract and relax spontaneously, and these rhythmic contractions continue for many hours.

2. If the pig's ureter be kept on ice in Locke's solution it can be revived by the above method and will begin to contract spontaneously as late as forty-eight hours after the death of the animal.

3. Precisely the same results were obtained with ureteral rings from a man (nephrectomy).

4. Adrenalin markedly increases the rate of contraction and the tonicity of the ureter.

5. Even a quiescent ureter can be revived and started to beat by the addition of minute doses of adrenalin (one drop 1:10,000 in 50 Cc. Locke's solution).

6. Atropine stops the contraction of the ureter.

7. Physostigmine antagonizes the action of atropine.

8. Papaverine causes a marked relaxation or lowering of the tonicity of the ureter, and if not too concentrated does not inhibit the peristaltic contractions.

9. The very low toxicity of papaverine, its general analgesic properties, its local analgesic effect (as noted by Pal and verified by the author), and its property of lowering the tonus of smooth muscle structures suggested its introduction directly into the ureter in a case of ureteral calculus, with a successful therapeutic result, namely, the passage of the stone.

10. An extensive study of the pharmacology of the ureter is now in progress.

SOME OBSERVATIONS ON ANESTHESIA AND ANALGESIA.

JACKSON in the *Journal of Pharmacology and Experimental Therapeutics* for February, 1916, reminds us that for a number of years past nitrous oxide has been constantly growing in favor as a general anesthetic and analgesic. This has been made possible mainly by the introduction of improved methods of administration. Still further improvement in these methods may very well lead to a greatly increased usefulness of the substance. The duration of the anesthesia under nitrous oxide has also progressively increased from an average of only a minute or two up to an average of perhaps ten minutes or longer. Jackson has been able by an improved method to keep dogs anesthetized for periods up to five and one-half hours.

Quite recently there has been a slight tendency to avoid the use of nitrous oxide in any prolonged operation (half an hour or more), because it has frequently appeared that the after-effects of prolonged nitrous oxide anesthesia were more deleterious than those of ether. Jackson strongly suspects that this has mainly been due to the use of improper and unscientific methods of administering the nitrous oxide. He be-

lieves that the cost of nitrous oxide anesthesia by the method which he has used may be reduced to about 30 or 35 cents per hour for the human subject.

There is a striking similarity between the action of morphine and that of nitrous oxide as observed experimentally on dogs. In the present work the nitrous oxide and oxygen have been administered by means of a special apparatus which permits a single "dose" of nitrous oxide to be breathed continuously over and over, without either loss or gain in the amount of the gas, while at the same time oxygen is given to the animal in suitable proportions to maintain the circulation and respiration in good condition. The carbon dioxide and watery vapor exhaled by the animal are constantly removed from the oxygen and nitrous oxide breathed by washing the respiratory medium through strong sodium and calcium hydroxide solution, and through concentrated sulphuric acid, respectively. Under these conditions it is possible to administer the nitrous oxide in very gradually increasing doses. and the progressive effects produced on the animal can be readily observed and studied.

Among the more striking points of similarity to morphine is the production of Cheyne-Stokes respiration. This is generally present in prolonged anesthesia in dogs. Presumably this would also be true in man. The conjunctival reflex is not lost in dogs under nitrous oxide. This is true in practically all cases and for all degrees of the anesthesia. It is only in the presence of immediately impending death from excess of nitrous oxide (which implies a small supply of oxygen, although no excess of CO_2 may be present in the gases breathed) that a dog will fail to wink its eyelids if the cornea be only gently touched with a piece of cotton. The pupils are dilated, but the light reflex is preserved. The irritability of the cord is much less depressed than is the case with the methane series of anesthetics. A peculiar feature is noticed in the fact that the animal, while lying quietly and apparently well anesthetized, may be aroused and waked up by stimulation or shaking in a very similar manner to that possible under a moderate dose of morphine. When thus aroused there is often observed a marked acceleration and increase in strength of the heart-beat. If the animal be again left alone it will soon return into the somnolent or perhaps analgesic state, very much as occurs after morphine.

It is difficult to study the analgesic effect of nitrous oxide separate and apart from the production of total unconsciousness in dogs. For these animals, so long as they are conscious, are very likely to struggle and try to escape even though they feel no pain whatsoever.

There seems to be no doubt that, as a rule, the human subject must be more susceptible to nitrous oxide than dogs. In experiments on himself, Jackson has easily been able to produce a state of almost complete unconsciousness with quantities of nitrous oxide very much less than are required for dogs. And similarly the period of time needed to fully anesthetize a dog is often more than five minutes, while in the human subject it is seldom more than two minutes (with oxygen). And further, the duration of anesthesia in dogs, after the face-piece is removed, is often not greater than one second, especially if the animal has been anesthetized for only a little while; in man it may last forty or fifty seconds. A considerable degree of anoxemia is often imperative to keep dogs anesthetized with the gas. This seems to be much less necessary (even if it cannot always be avoided) in the human subject. Jackson believes this difference in susceptibility is due to the higher organization of the central nervous system in man.

The action of ethyl chloride is about midway between that of nitrous oxide and of ether. Neither nitrous oxide nor ethyl chloride is a very suitable anesthetic for dogs. It is undoubtedly capable of greater usefulness in the human subject. A peculiar walking movement of the legs is very often present in ethyl chloride anesthesia; spasm of the jaws may occur and may even cause considerable difficulty in breathing. In one animal this clinching of the teeth

lasted for several minutes after the drug had been removed (done mainly on account of respiratory difficulty).

The action of ethyl bromide is about midway between that of ether and of chloroform. Spasmodic walking or swimming movements may also occur in dogs under this drug. The corneal reflex is lost early in the administration. The heart and respiration are both strongly depressed by even small amounts (0.5 Cc. to 1 Cc. in dogs).

A DISCUSSION OF ACIDOSIS.

HOWLAND and MCKIM in the *Bulletin of the Johns Hopkins Hospital* for March, 1916, tell us that even when no evidence of disease can be detected to which the acidosis can be referred, acidosis may be found. For instance, a boy of six was suddenly taken ill with high fever. Inside of twelve hours he was brought to the hospital with great dyspnea of the air-hunger type. Physical examination was quite negative except for a purulent otitis media. All the tests made indicated acidosis. The bicarbonate of the blood was greatly reduced. The reaction of the blood had shifted markedly toward acidity, and yet the acetone bodies in the blood were not greatly increased. The tolerance for alkalies was enormously increased. Though he took by mouth 20 gm. of soda and 6 gm. by rectum without vomiting or diarrhea, no change in reaction of the urine was produced thereby. But the alkalies had a profound influence upon his condition; his respirations diminished in rapidity and depth, the evidences of acidosis to be obtained by the various tests rapidly disappeared, and he made an uninterrupted and apparently complete recovery; for he now seems entirely well and has been so for six months.

We may say that acidosis is not an uncommon condition in infancy and childhood; that while it is especially frequent in the severe diarrheas of infancy, it may appear with a variety of diseases, and sometimes, apparently, alone. To recognize it with older children is not very difficult. The character of the respiration is usually sufficient to arrest one's attention, and one or two relatively simple laboratory tests will quickly determine the question one way or the other. With infants who are irritable, restless, and crying, it is much more difficult to say whether hyperpnea is present; and yet with them it is most important to make the diagnosis early, for the reason that acidosis is such a fatal complication of diarrheal disease in infancy. Older children react promptly and often permanently to alkali therapy. It may be possible to stop the clinical and laboratory evidences of acidosis in infants, but the patients usually die. Why they do cannot be determined at the present time. Many normal processes have undoubtedly been inhibited, perhaps permanently, and many abnormal ones stimulated. A restoration to normal conditions seems nearly impossible. For this reason we should not wait until acidosis can be demonstrated. From the beginning we should give bicarbonate of soda to infants with severe diarrhea in sufficient quantity to render the urine alkaline and keep it so.

We may lay it down as a general maxim that as hyperpnea indicates acidosis, so hyperpnea indicates alkali therapy, and this for infants or older children. The alkalies may be given by mouth, by rectum, subcutaneously, or intravenously. Vomiting and diarrhea frequently render their administration by mouth or by rectum out of the question. Then one of the other methods must be employed. Intravenous administration is the method of choice, especially when rapidity of action is desired—and with acidosis rapidity of action is always desired. The superior longitudinal sinus, as advised by Marfan, Tobler, and Helmholz, is available with infants, or the external jugular or femoral veins. With older children a vein in the arm can often be employed. If facilities for the intravenous injection of alkali are not at hand, the injection may be made subcutaneously, with care that the bicarbonate has not been transformed into the carbonate, else severe sloughing of the tissues may result. A four-per-cent solution is usually employed for intravenous use and a two-per-cent so-

lution for subcutaneous use. The quantity to be injected depends upon the size of the child, the severity of the symptoms, and the effect produced, but the amount is always large. It must be given until the urine becomes alkaline; even in infants under one year, as much as 10 gm. in twenty-four hours may be required.

With the cases of acetone-body acidosis with no sugar in the urine and with a low sugar content of the blood, glucose by rectum, subcutaneously or intravenously, seems clearly indicated in addition to the alkali. With all forms water is urgently required, especially with infants who are depleted as a result of the vomiting and diarrhea.

FURTHER OBSERVATIONS ON THE CLINICAL ACTIONS OF VERATRUM.

In the *Journal of Pharmacology and Experimental Therapeutics* for February, 1916, COLLINS points out that the effects of veratrum on the circulatory system have been studied in a series of cases in the same manner as reported in a previous publication. These comprised normal and pathological individuals, among which were the following: alcoholic cirrhosis, paroxysmal tachycardia, heart-block, acute and chronic nephritis. The following conclusions seem justified:

1. A slowing of the pulse and fall in blood-pressure occur with single therapeutic doses of 15 to 30 minims of the tincture veratrum album, and this occurs independently of such symptoms as nausea and vomiting (toxicity).

2. Large and repeated doses produce a slowing of the pulse in 100 per cent of the cases; a fall in both the systolic and diastolic blood-pressure in 73 per cent. The fall in blood-pressure is roughly proportional to the dose.

3. Repeated small or large doses with short intervals between doses give rise to symptoms of toxicity (headache, nausea, vomiting, etc.). These effects are absent with small doses given at longer intervals.

4. To both therapeutic and toxic doses normal individuals respond with a fall in systolic and diastolic blood-pressure and a slowing of the pulse.

5. Very little or no effect was observed in the following conditions: arteriosclerosis, paroxysmal tachycardia, heart-block (one case of each).

6. The most marked effects with veratrum are observed in cases of hypertonus.

7. Using tincture of gentian under the same conditions as veratrum in the same individuals, no effects on the circulation were demonstrable.

TREATMENT OF HAY-FEVER WITH POLLEN TOXIN.

In the *Long Island Medical Journal* for May, 1916, HOWE states that the treatment of hay-fever or pollinosis has been successfully established in the past two years. Some confusion still exists regarding the preparation of the toxin; how long before the onset of the hay-fever symptoms treatment should be initiated; and the relation of skin reactions to the degree of immunity attained. But more or less successful results are being attained regardless of how the toxin is prepared, or whether the injections are begun before or after the onset of the symptoms. The attainment of absolute immunity for succeeding years is a question that only time and a wide experience can positively establish.

The study of anaphylaxis, particularly of the respiratory tract, such as hay-fever, vasomotor rhinitis, and asthma, has developed some very positive facts that must be fully comprehended to diagnose and treat pollinosis successfully. Anaphylaxis of the respiratory tract is a group of symptoms which indicates the absorption of a native or unmodified protein. In hay-fever the absorption usually occurs through the mucous membrane of the nose, and the protein is usually of vegetable origin in the form of pollen. In vasomotor rhinitis the absorption is nasal, but the protein may be from either vegetable or animal source. In asthma the absorption is usually through the mucosa of the alimentary tract, and may be animal, vegetable, or bacterial in origin.

In certain cases of hay-fever or pollinosis, if the sensitization is sufficient or if the amount of pollen protein absorbed is sufficient, asthma will develop coincident to the nasal or hay-fever symptoms. In fact vasomotor rhinitis, hay-fever, and asthma are simply measures of the degree of anaphylactic reaction. If nasal stuffiness occurs, as in mild attacks of pollinosis, it is called vasomotor rhinitis. If the reaction is more severe, then ensues nasal occlusion, rhinorrhea, sneezing, burning and itching of nasal mucosa and the conjunctiva, and it is called hay-fever. If the reaction is still more pronounced, a vasomotor bronchitis, otherwise known as asthma, results. All the nasal symptoms of hay-fever are but various degrees of vasomotor paralysis of the nares; all the bronchial symptoms of asthma are but various degrees of vasomotor paralysis of the bronchi and measure the extent of sensitization or protein absorption.

Another recently established fact is that chemically similar proteins will produce anaphylactic inter-reactions regardless of what the biological relations of their sources are. If a subject is sensitized to any of the three varieties of ragweed, the pollen from either of the other two varieties will cause anaphylactic reaction or hay-fever, because they are not only biologically closely related, but because the proteins in their pollen are chemically identical. If the proteins are not chemically identical, the pollens will not inter-react, regardless of the closeness of the biological relation. The establishment of this fact makes it possible to determine by skin reactions by what group or family of plants a victim of hay-fever is sensitized. Then by testing with pollen of the various members of that group the guilty member can usually be determined.

This is an important phase in the treatment of pollinosis. When pollen is rubbed into a skin incision, in a sensitized individual, a local vasomotor reaction results, provided the individual is sensitized to the pollen of that flower. In other words, a larger or smaller wheal results. The interstitial changes in the skin are identical with the intranasal changes in pollinosis and the intrabronchial changes in asthma, and serve as a means to identify the offending pollen.

There are four seasons of the year when people usually develop pollinosis. The earliest is during the flowering period of the dandelion, apple, willow, oak, and maple. The symptoms during this season are usually very mild and are frequently diagnosed as a slight but persistent cold. The flowering of the grasses usually starts the second season. Beach grass and timothy are the chief offenders. The anaphylactic reaction is frequently quite severe, and is popularly known as rose cold. This occurs in June and early July. Another but erratic season occurs in the latter part of July, when the daisy covers the fields. The great season begins with the maturity of the ragweed blossom around the middle of August—most people designate the 18th as the initial day—and lasts till the blasting hand of frost puts an end to this pest weed that so generously fills the air with its pollen.

During the season of 1915, forty-seven cases of hay-fever came under Howe's care. Forty-two of the forty-seven cases were more or less benefited or relieved by the injection of a pollen toxin. Three received absolutely no relief from the treatment, and two discontinued it for various reasons before results could be expected. Of the forty-two favorable cases twenty-three were practically rendered immune, except for two or three outbreaks that lasted for twenty-four to forty-eight hours. These cases were entirely free from any uncomfortable symptoms after immunity was established except for these few short outbreaks. The remaining nineteen cases were relieved to such an extent that none were obliged to leave their occupations or to leave the city. Most of them were entirely free from symptoms a greater part of the time. The rest of the time their symptoms were annoying but not distressing, and their hay-fever season was made not only very mild but much shorter. Treatment was begun before the onset of symptoms in sixteen cases. Of these ten were entirely

immune throughout the season, developing no symptoms. Twenty-six cases came under treatment after the beginning of their hay-fever. Eleven of these were practically free from symptoms after immunity was established; while fifteen were subject to several short attacks with intervals of absolute freedom, or to a persistent mild nasal stuffiness with no rhinorrhea, sneezing, or conjunctival itching or burning. By skin tests Howe has found that most of these cases were sensitized to two or more pollens, and the persistent mild nasal symptoms were due to a slight sensitization to pollen of which he had no toxin.

The local reaction at the point of injection was usually very mild or none at all. In no case was treatment discontinued because of this discomfort. Rather severe anaphylactic symptoms developed in two cases: one in which rapid immunization was attempted, and one in which the toxin failed to relieve and the dosage was too rapidly increased. From eight to twenty injections of toxin were necessary to produce or maintain immunity. The injections were at intervals of one to ten days. Where symptoms were very distressing, the injections were given twice a day.

The following interesting observations were made: A prominent surgeon who had been absolutely incapacitated by his nasal symptoms and asthma during the hay-fever season for over twenty years came under treatment six days before the usual onset of symptoms. As a result of the toxin treatment he was absolutely free from hay-fever throughout the season. A dentist was obliged to give up his chair, and a butcher serving his customers because of a very copious nasal drip. Both resumed their work twenty-four hours after the initial injection. One young man sought treatment after ten sleepless days and nights, due to nasal distress and asthma during the intensest heat of last summer. He threatened to use a gun on himself unless relieved. Within three days he was able to sleep without difficulty, and remained immune the rest of the season. In several instances in which active symptoms developed during a dry and windy spell, the symptoms cleared up within two hours after an injection. At one time several cases which had been entirely immune reported active symptoms. Howe was at a loss to understand why they should all go wrong at once. Upon testing the toxin he found it had deteriorated and was useless. From that he learned that pollen toxin deteriorates so rapidly that it is absolutely useless within forty-eight hours after the change begins. Hence the necessity of fresh toxin every eight to twelve days.

In the treatment of hay-fever, winter should be the time of preparedness. During the recent months Howe has made skin tests to determine the offending pollen in the new cases and the degree of sensitization still existing in the cases treated last summer. In practically all cases the skin reactions in the new or untreated cases have been more severe than in the cases he treated last summer, indicating the attainment of a certain degree of permanent immunization. The increase of the permanent immunization as well as the relief of the distressing active symptoms is the sought-for goal in this treatment.

BLOOD TRANSFUSION.

MILLER in the *Long Island Medical Journal* for May, 1916, states that before performing blood transfusion by any method, it is advisable, except in urgent cases, to make a Wassermann test of both donor and recipient, agglutination and hemolysis test, blood-pressure, pulse-rate, and careful examination of the heart, blood examination as to the number of red and white corpuscles, hemoglobin and coagulation test, and a complete urine examination.

The operator and assistants should disinfect themselves similarly to the preparation for a major operation.

Donors should not be stout, nor over thirty-five years of age, and free from all disease.

When the veins are small or the individuals are fat, it may be of advantage to cut down and isolate the vein for about a

half to one inch, using novocaine or cocaine to infiltrate the tissues or spraying ethyl chloride locally.

If the valve syringe he advises be used it will enable one to perform blood transfusion after a little practice with ease, accuracy, and safety.

There will be no loss of blood of any appreciable amount, nor will it be necessary to fill the patient with a volume of salt solution during transfusion.

The washing of syringes by nurses during transfusion can be dispensed with, and only a few syringes are necessary.

The formerly-considered major operation for transfusion of blood will, by the use of the valve syringe, be converted to an operation of minor character which can be carried out in the doctor's office and in the patient's home without a nurse and with but one assistant.

By the use of the valve syringe there will be no necessity for medicating the blood in the hope of preventing coagulation.

In addition to the use of the valve syringe for blood transfusion it could be used for aspirating in paracentesis, etc.

The instrument is manufactured by Kny-Scheerer Co., New York.

EMETINE IN INTESTINAL HEMORRHAGE.

ALLAN in the *Prescriber* for May, 1916, reminds us that the therapeutic value of emetine hydrochloride has within recent years been more generally recognized, and its usefulness in various hemorrhagic conditions has been demonstrated. Allan has recently had an opportunity of noting its effects in the case of soldiers who have returned from the front with dysenteric symptoms, accompanied by blood and mucus in the stools. The effect of a hypodermic injection of emetine hydrochloride (one-third grain) once daily has been wonderful; it has brought about the speedy disappearance of the blood from the stools, while the diarrheic symptoms have likewise quickly improved. In another case of a soldier in training who developed most troublesome mucous colitis, which resisted the usual remedies, the injection of emetine hydrochloride in the dose above mentioned was successful in curing the condition. The drug has been used in other affections, and it would appear to have a wide sphere of usefulness. It is, in Allan's opinion, worthy of an extensive trial, and should be included in the therapeutic armamentarium of all medical men engaged in military work.

CONGENITAL DILATATION OF THE COLON.

Under this title SMITH (*Lancet-Clinic*, March 25, 1916) notes that Hirschsprung in 1886 gave the first clear description of the condition. He quotes Schneiderholm's collection of 358 cases, to which he has been able to add 26 further reported cases, and 8 which he has personally seen, making a total of 392 up to October 1, 1915.

True megacolon—idiopathic dilatation—is congenital and is distinct from the so-called pseudo-megacolon, which occurs in adults. The latter type is probably quite different in etiology, and is usually associated with long-continued constipation, with more or less mechanical obstruction to the emptying of the colon. Hirschsprung believed that true megacolon begins *in utero* as a dilatation and hypertrophy, and this opinion is shared by the majority of writers. The relatively greater length of the mesentery of the colon in the fetus and infant favors obstruction, with secondary dilatation and hypertrophy. The condition has been observed in the new-born, and the history of the disease in each instance dates back to birth. Defective nerve supply to the colon has been suggested as a possible cause, but there has never been any histologic evidence of nerve paralysis. Spasmodic conditions, urged by some writers as the cause, are not found in the majority of cases. Several authors have attempted to demonstrate a valve action in the rectum causing obstruction, but their conclusions are not convincing. The ulceration which is often present is almost surely secondary, due to the fecal stasis—not primary, as has

been stated—and has no etiological significance. We really know little more positively about the cause of this disease than was stated by Hirschsprung in his original contribution.

Pathologically there is a marked dilatation of the colon—often only a portion —usually the sigmoid. The walls are markedly hypertrophied, the change being produced largely by an increase in the circular muscle fibers. There is also an increase in the size of the lymph and blood-vessels. There is often ulceration on the inner surface, and sometimes a peritonitis where these ulcers have perforated. No mechanical obstruction is found in the great majority of cases. Histologically, besides the increase in circular muscle fibers, there is some connective tissue increase and the mucosa shows diffuse cell infiltration.

The history and clinical picture are quite characteristic — obstinate constipation beginning very early in life—in a child with a large abdomen. The obstinate constipation is often intermittently relieved by attacks of diarrhea. There may be also times of vomiting, with almost complete obstruction. Pain is not a common symptom, except in the obstructive attacks. Death due to obstruction is the final outcome of the severe cases not treated by surgical means. It is said by several authors that children with this disease are usually below par mentally; but the author has been unable to confirm this from the rest of the literature, or from his own cases. The lower borders of the ribs flare widely outward to the distended abdomen. The abdomen is tympanitic throughout, and sometimes fecal masses can be felt within the dilated colon. After enemata the size of the abdomen is reduced, frequently many centimeters. There is visible peristalsis; often the full outline of the coils of intestine may be seen through the abdominal wall. Bismuth enemata and *x*-ray furnish the final proof of the disease.

In this connection the author gives the following caution: After the *x*-ray has been taken the colon should be emptied of the bismuth as soon as possible. Unless vigorous means are taken to accomplish this the bismuth may be retained for a long time, for one month at least, and may be the cause of severe vomiting and even obstruction. Enemata and cathartics should be used, and the stool examined daily until no more bismuth crystals are found.

Cases are divided into two groups, which are fairly distinct, and which may be separated after careful study from one another. The treatment of the two groups is quite different; they are distinguished by the presence or absence of marked obstructive features. The non-obstructive group has the constipation, the large colon with its hypertrophied wall, and the visible peristalsis, but does not have the recurring attacks of pain, fever, vomiting, and signs of acute obstruction. The stubborn constipation will yield, in many instances, to careful treatment. The second group has attacks of obstruction, despite every effort to prevent them. When an individual patient is seen for the first time it is impossible to place it in either group until there has been careful study. Patients falling in the first group should be treated medically, and those in the second group surgically.

The medical treatment consists in an effort to empty the colon and keep it from becoming obstructed.

Irrigations of saline or oil are usually necessary at occasional intervals, at least to bring down any hard fecal masses which may be retained. Faradization has been used, one electrode placed in salt solution in the rectum. Massage helps to strengthen the abdominal wall and to mechanically move along the fecal material, especially if a drainage tube is placed in the rectum. On the theory that there is a spasmodic element favoring obstruction, the use of antispasmodic drugs, as opium and belladonna, has been urged and some favorable results reported.

The diet is a most important factor of the treatment. All writers agree that it should be non-fermentative; some believe in a small residue, others in a bulky residue.

Large quantities of water should be given, that there may be no chance for a dry stool. Russian oil helps greatly in keeping the surfaces of the colon sufficiently smooth to favor the passing along of the contents. With this kind of a diet and the daily attempt for a movement at a regular time, the need for enemata and irrigation is reduced to a minimum.

The results of treatment have been tabulated by Schneiderholm as follows:

Three hundred and fifty-eight cases—39 unknown; 9 treated without success; 24 improved, 7 per cent; 110 cured, 30.7 per cent; 176 died (11 not from colon), 46 per cent.

One hundred and fifty-one cases treated medically—14 unknown; 6 unimproved; 14 improved (twelve children); 38 cured (thirty-one children), 25 per cent; 79 died, 52 per cent.

One hundred and forty-three cases treated surgically—12 unknown; 3 unimproved; 9 improved; 67 cured, 46 per cent; 52 died, 36 per cent.

The causes of failure under medical treatment were improper methods, or treatment begun too late, or continued for too short a period. In the favorable cases the colon was reduced in size and the hypertrophy lessened, as well as the symptoms relieved. As the children grow older the colon becomes more like that of the normal adult.

When medical treatment has been given a faithful trial and there is no benefit, or when the obstructive symptoms are in the foreground, or repeatedly reasserting themselves, surgical measures must be resorted to. Young children stand an extensive operation poorly (twenty-six died out of sixty-nine operated upon), so that it should be undertaken with a full realization that the risk is large. Colopexy or resection at two sittings give the best results. Artificial anus is more dangerous and gives no better results than irrigations and constant drainage. When completed the operation should have been thorough enough so that no further operations will be necessary.

RINGWORM OF THE HANDS AND FEET.

LANE (*Boston Medical and Surgical Journal*, Feb. 24, 1916) quotes Sabouraud to the effect that eczema marginatum frequently affects the feet and occasionally affects the hands; and also states that eight out of ten of the so-called eczemas of the feet are really parasitic, and that "the interdigital spaces of the toes are really the most frequent location of eczema marginatum of Hebra."

In spite of the descriptions of the disease that have been published, it is still not very well known. Hartzell says that "the profession, with the exception of those specially concerned with cutaneous diseases, is as yet quite unaware of its existence, and failing to recognize its parasitic nature, fails completely in its treatment."

There are few statements as to whether the hands or the feet are more frequently affected, but it is probable that the feet are much more often the location of the disease than are the hands. Four cases were seen by Hartzell in the last few years. Three were on the feet and one on the hands. Sutton, who would not overlook this disease, in the discussion which followed a recent excellently illustrated paper on palmar eruptions stated that "the condition (of ringworm of the hands) must be a somewhat rare one."

Marie Kaufmann-Wolf has recently made an important contribution to the knowledge of ringworm of the hands and feet, which indicates that it is much more common than has hitherto been thought to be the case. The cases studied were clinically dysidrosis (pompholyx). In about a third of the cases, seen by her during seventeen months in Paris, Vienna, and Berlin, clinically diagnosed as dysidrosis, the diagnosis of ringworm was established by microscopical examination. There were twenty-five cases so diagnosed, and the fungi were grown in all but three cases. In seventeen of the twenty-five cases a hitherto undescribed trichophyton was found. This has not yet been definitely classified, but Wolf, Sabouraud, and Plaut

are of the opinion that it is a fungus of animal origin, closely related to the trichophyton equinum. This would also seem to indicate that in this type of cases the epidermophyton inguinale, which was found only twice, is not the most frequent cause of ringworm of the feet, although the statement of Sabouraud still holds good, that this variety is much more common on the feet than on the hands. However, the question as to what varieties of fungi cause these conditions is of pure scientific interest. The important point for the clinician is the fact that they are not very infrequent and that they present very varied appearances.

The cases of ringworm of the hands and feet which present the typical classical picture of a nearly circular eruption, with an elevated, vesicular border and a center which tends to heal, are few. When such a picture is presented the clinical diagnosis is fairly certain. In most cases such a diagnosis is impossible, though in a certain number of cases there are some less distinctive signs which should suggest the possibility of the presence of ringworm. Intertriginous affections of the toes which extend toward the plantar surface of the foot are always suggestive. Eruptions resembling a limited vesicular eczema, whether on the hands or on the feet, should not be dismissed as an eczema without consideration of a trichophytic origin. Kaufmann-Wolf's study demonstrating the fact that many of the cases of clinical dysidrosis are in reality trichophytosis, shows the importance of the investigation of every case of this disease with this possibility in mind. The points which she mentions as of assistance in making a clinical diagnosis of ringworm in such cases are: the acute onset of the affection, especially in warm weather, the constant accompaniment of itching, the usual locations on one hand or one foot; though there are numerous exceptions to the unilateral location, the interdigital location, when on the foot, with extension toward the plantar surface, frequent extension toward the inner border of the foot, the deeply placed vesicles with a tendency to grouping, to confluence, to rapid pustulation, and their slight tendency to oozing.

In many cases there are no signs which especially suggest the condition. In all doubtful cases of eruptions on the hands and feet a microscopical examination should be made. The technique is simple. Loose scales from the edges of the eruption and the tops of the unbroken vesicles should be chosen, as the fungi are usually more abundant in those locations. The scales or a small piece of skin is placed on a slide, one or two drops of a 20- to 40-per-cent solution of potassium hydrate is added, and covered with a cover-glass. The slide is heated over a flame till bubbles appear in the solution. If necessary this is repeated until the scales are soft enough to be easily disassociated by slight pressure on the cover-glass. There is usually less difficulty in finding the fungi from lesions on the feet than from those on the hands, as conditions on the hands are less favorable to their growth and the more exposed location and frequent washings mechanically remove the superficial ones to a considerable extent.

The mechanical removal of the superficial layers of the skin is an important part of the treatment. This is well accomplished by soaking and then scrubbing with a moistened cake of pumice stone or coarse sand soap. Sabouraud says that on the hands this treatment is more useful than antisepsis, and that the lesions can be cured by this treatment alone in most cases. As an antiseptic application he recommends a one-per-cent solution of iodine in 60-per-cent alcohol. On the feet a similar treatment is used, but the solution of iodine is employed from the start. If this is not successful, a one-per-cent chrysarobin ointment is applied. Hartzell recommends the ointment suggested by Whitfield, which is composed of 3-per-cent salicylic acid and 5-per-cent benzoic acid. After there is apparent cure the treatment is suspended for a week and then resumed for a few days, with the view of destroying any fungi that may have escaped. If dermatitis is

caused by the antiseptics used, they are replaced by a soothing ointment until it has subsided.

In cases in which ringworm may be suspected, but in which it is impossible to demonstrate fungi, it may be wise to try such treatment, for a trichophytosis, treated as an eczema, or untreated, will continue indefinitely. Sabouraud mentions having seen one case of more than three years' duration.

Ringworm of the nails is exceedingly difficult to cure. The best treatment appears to be to scrape the affected parts of the nails frequently, and to keep an antiseptic ointment applied as constantly as possible.

PNEUMOTHORAX PUNCTURE.

VON ADELUNG (*Interstate Medical Journal,* April, 1916) observes that the frequently free pleural space is found anteriorly in the second and third interspaces when the generally preferred lower area toward the base is obliterated by adhesions. As to the needle, sharp ones are to be preferred, the author stating that he has never yet encountered a case in which the dull needle was of any service when the sharp needle failed to find the pleural space. A length of 3 or 4 cm. is usually enough. To search beyond the depth of the chest wall for the pleural space convicts the operator of anatomic ignorance. A long needle of 9 cm. will be found convenient since it is more readily handled. Moisture of any kind—water, alcohol, or blood—in the lumen of the needle prevents or perverts the manometer readings in such a way as seriously to mislead. The patient usually lies in a natural comfortable horizontal position. When it is desired to introduce gas in the presence of pleuritic fluid, the fluid level should first be determined, preferably by fluoroscopy, and the needle can then be introduced into the free space above the fluid level, for which purpose it will be found that the sitting or semireclining position will best serve the purpose.

The chosen site is sterilized by painting with tincture of iodine. After this has dried, it is washed off with alcohol. By means of a sterile hypodermic syringe a sterile 2-per-cent solution of novocaine with adrenalin is injected intradermically, subcutaneously, and into the successive layers of tissue until the pleura is reached. The skin and the pleura, being the most sensitive tissues, call for the most careful anesthetization. Five to ten drops suffice. In a few moments the sterilized gas-needle may be introduced without pain. In introducing the gas-needle, care should be taken to avoid the edges of the ribs. After passing the point through the skin, which is easily accomplished with a sharp needle, without previous cutting, and before the whole thickness of the thoracic wall has been penetrated, the rubber tubing is slipped over the end of the needle and the three-way stop-cock opened to the manometer. The apparatus thus being ready to record any pressure change, the needle is pushed slowly onward until it reaches the pleura. If the pleura is not adherent, the manometer will immediately record the arrival of the needle in the pleural space. The distance at which this will occur should be judged by computing the thickness of the chest wall.

Most writers agree that when the needle arrives in the pleural space the manometer indicates the fact by regular oscillations, varying in length from 1 to 4 cm. of water. And indeed, this is the only trustworthy indication of safety, and gas should not be introduced until this indication has been obtained. However, it must be stated here that the viscosity of the contiguous pleural layers frequently holds them together even after the needle-eye is between them. But the manometer will then give a sudden jerk to 1 or 2 cm. negative pressure, though free oscillations will not occur. By allowing a very little gas, 2 or 3 Cc., to flow through the needle, the pleuræ are separated, and satisfactory oscillations will be obtained, indicating safety. The oscillations should be free, and synchronous with the respiratory movements. Unless one is aware that the viscosity of the pleuræ may prevent free oscillations until some gas has been in-

troduced, one may easily be deceived and abandon a good puncture for lack of ability to recognize this earliest signal of the manometer—namely, a sudden jerk to negative pressure. It is the writer's impression that with the dull needle this early signal is not as readily obtained as with the very sharp needle.

When the treatment is finished it is unnecessary to apply any dressing whatever unless high positive pressure has been induced. In that case a compression bandage will be found of value to prevent subcutaneous emphysema. Generally, it is well to have the patient apply digital pressure through a sterile pad for about twenty minutes, when it may be removed and no further care taken. Even with high pressure, 30 or 40 cm. or more of water, the puncture closes within twenty minutes. Either pleural exudate, blood clot, or mere adhesion probably occurs rapidly.

The Forlaniñi puncture is simple, safe, painless, and successful in the hands of an operator who gives attention to details and understands his apparatus.

GENERAL PRINCIPLES IN THE TREATMENT OF CEREBRAL TUMORS.

KANAVEL (*Saint Paul Medical Journal*, vol. xviii, No. 1, 1916) groups the symptoms as follows:

Those produced by irritation or depression of the neurologic or physiologic function of the area involved; *e.g.*, monoplegic motor paralysis or acromegaly associated with hypophyseal disease.

Those produced by irritation or depression of neurologic or physiologic function in adjacent nervous structures and changes in other adjacent anatomical structures; *e.g.*, sensory aura in motor tumors, adiposity in third ventricle hydrops, and the enlarged sella turcica in hypophyseal tumors.

Those associated with the nature of the growth. Here we emphasize the coincident systemic tuberculosis in the tubercles of the brain; the leucocytosis, fever, ear and nose findings, etc., associated with abscess; the coincident Wassermann and syphilitic findings in gumma; the destruction of tissue and rapid growth associated with sarcoma; the cystic degeneration and sudden hemorrhage with consequent signs found in gliomata; evidences of carcinoma, deciduoma malignum, neurofibromatosis, etc.

In operating, when the intracranial pressure is so great as to interfere with the operative procedure, puncture of the ventricle should be done. It is the part of wisdom to let gliomas alone, since the removal at best will be but partial and the tumor will grow more rapidly after such an attempt. Non-vascular cystic tumors may be gliomata living dormant into which hemorrhage has occurred. If the growth is firm and sharply outlined, the tumor is probably an endothelioma, and operation is indicated. If the tumor lies below the cortex and can be felt but not seen, it speaks for glioma, which should not be operated upon, except if cystic it may be gently aspirated. If the tumor is well defined, however, it may be a cyst or abscess demanding removal.

Cysts are more common in the cerebellum. Of these there are many varieties: parasitic, dermoid, serous, due to transformation of sanguineous effusion or an area of softening or hemorrhage into a glioma, and cysts due to serous meningitis.

The temporosphenoidal lobes are frequently the seat of tumors which, especially upon the right side, may be removed extensively.

Tumors of the interior of the forebrain or midbrain and those involving the ventricles are inoperable. Where a tumor of the cortex is removed and the resulting defect connects with the ventricle, no alarm need be felt, but one may here interpose a pad of fat to fill the defect, being careful not to use too large a piece.

Tumors arising from the dura can be removed without difficulty either by peeling them off or removing the dura involved and transplanting a flap of fascia lata to take its place.

Where a cyst sac can be removed, it should be done; if thin-walled it may be removed by grasping the edges of the open-

ing and twisting slowly and gently. If this is not feasible, the walls may be cut away, or if the wall is too thick for this it should be curetted so as to thin it and favor collapse. Paint the interior with iodine to further irritate the connective tissue and destroy any epithelial cells so that union of the collapsed walls may take place. In exceptional cases drainage either into the subdural space or into the subaponeurotic space may be indicated. Elsberg suggests a strip of Cargile membrane for drainage material.

Attention should be called to puncture of the corpus callosum. Carried out for diagnostic and therapeutic purposes, this procedure is a measure of considerable value in some cases. It has been used most often in hydrocephalus, hypophyseal, cerebellar, and other tumors of the ventricles. The principle upon which it is supposed to act is that in such cases in which the pressure is high, if an opening be made through the corpus callosum into the subarachnoid space between the hemispheres, the intraventricular pressure will tend to keep the opening patent and thus provide a permanent intraventricular drainage into a space where absorption of the secreted fluid is freer than in the ventricle. There is very little danger to the procedure. Veins may be injured, leading to troublesome hemorrhages, or too deep puncture may injure the optic thalamus with temporary impairment. This is especially to be feared in basal tumors distorting the ventricle.

TREATMENT OF CHOLELITHIASIS.

Boas (*Surgery, Gynecology and Obstetrics*, May, 1916) states that there has been such an enormous increase in the number of cases of cholelithiasis since the beginning of the war that it may almost be called a war disease. This is due to the increased nervous strain due to war conditions. Married women are especially liable to gall-stone disease, and they are now especially subjected to worry on account of the loss of their husbands and sons, the breaking up of their homes, the difficulty in obtaining food, and the neglect of their own health.

The treatment is primarily surgical, especially when the stone is lodged in the common duct. No medicinal treatment will discharge the stone, and operation should be early, as the patient is subjected to the danger of cholemia if there is any delay. Chronic cholecystitis calls for operation also, especially in patients who have not the time and money for long-continued spa treatment. Acute febrile cholecystitis or cholangitis offers a more favorable field for medical treatment, while at the same time the prognosis for operative treatment is not so good.

In acute attacks of gall-stone colic it is a great mistake to give morphine, as it interferes with nature's effort to discharge the stone. The pain may be relieved by hot compresses, etc., or if a sedative must be given only small doses of papaverine or codeine should be used. Perhaps the reason there are so few successful attacks of gall-stone colic is that morphine is so freely given. Boas believes that local bloodletting is of great value. He sacrifices the skin over the gall-bladder and applies Bier's hyperemia cups. This is especially useful in cases in which there is extreme pain and enlargement of the liver.

There are no medicines that will directly prevent the recurrence of attacks of cholelithiasis. It is just as absurd to suppose that cholagogues will cause already existing stones to be discharged or prevent the formation of new ones as it is to suppose that gall-stones can be dissolved by chemical agents; but attention to diet and certain stomach conditions may aid in keeping the gall-stone trouble latent. Most gall-stone patients suffer from constipation, and an indication of prime importance is to keep the bowels regular. They also frequently have functional disorders of the stomach or ptosis of the stomach and intestines. Large amounts of food in the duodenum may obstruct the common bile-duct or facilitate the migration of bacteria into the bile passages. This assumption is confirmed by the fact that gall-stone attacks usually occur when

the digestive tract is overloaded, and by the fact that they do not occur when there is stenosis of the pylorus and the food is discharged into the duodenum in very small quantities. Therefore meals should be light and taken at short intervals, and heavy meals should especially be avoided at night. Spa treatment is of great value, not because of any specific effect of the waters, but rather on account of the associated rest, dieting, regular meals, baths, and outdoor exercise. The stay, however, should be much longer than is usually prescribed to be of any benefit.

In severe cases of acute cholecystitis Boas recommends the giving of calomel 0.1 gm. three times a day for at least four weeks. Russian physicians, who introduced this treatment, give as much as 0.5 gm. several times a day. The prognosis is much better where only the gall-bladder is affected than where the ducts are involved.

Recurrences after operation may be due to the reformation of stones or to adhesions; but these recurrences are not nearly so severe as the original condition and generally yield to prolonged spa treatment.

BISMUTH PASTE IN THE TREATMENT OF FISTULA.

BECK (*Surgery, Gynecology and Obstetrics*, May, 1916) injects bismuth paste liquefied by heating in a water-bath by means of a glass or metal syringe into the sinus until he feels reasonably certain that all ramifications have been filled. The paste thus injected will rapidly thicken and remain in the sinuses long enough to allow a radiogram to be taken. Such radiogram will frequently lead to the focus from which the disease originally started. In many instances it will reveal errors in previous diagnosis and consequently change treatment.

It is essential that every crevice should be filled at one injection, otherwise there will be a recurrence of suppuration. The symptoms of intoxication may be produced by too large a quantity being injected into pus pockets and allowed to remain for too long a time, because of the possibility of absorption of bismuth, which is likely to produce bismuth intoxication. Should the symptoms of bismuth poisoning appear the paste must be removed by washing out the cavity with warm olive oil. Sterile oil should be injected and retained from twelve to twenty-four hours, in order to produce an emulsion with the bismuth mixture. This emulsion should be withdrawn by means of a catheter or suction syringe. Scraping out the paste with a scoop is a dangerous procedure, because it opens new channels for absorption.

The paste gives excellent service in closing fecal fistulæ. Many successful cases are cited illustrating the cure of various intractable genito-urinary and fecal fistulæ. Failure is usually due to imperfect technique.

The cases reported usually had more than one unsuccessful operation performed before they were cured by the paste.

SHOCKLESS SURGERY.

KROENIG and SIEGEL (*Surgery, Gynecology and Obstetrics*, May, 1916) to eliminate the psychic trauma precede every operation by a twilight sleep. Patients in twilight sleep are particularly susceptible to stimuli of light. To avoid this the ears of the patients are plugged with "antiphone"—*i.e.*, cotton plugs saturated with oil or wax, or hard or soft rubber plugs, and a cotton pad over the ears. The eyes are bandaged with a soft silk bandage. With these precautions there is accomplished in the majority of cases a complete amnesia of the operation and preliminary preparations, or a complete indifference to the proceedings about them.

Blocking of the nerves is best done by conduction anesthesia.

Paravertebral anesthesia is quite simple in surgical laparotomies. Stomach, gall-bladder, and bowel operations are carried out without difficulty because the innervation is relatively simple; the organs themselves are not sensitive. It is necessary to determine only the desired field of operation

and to block the corresponding intercostal nerves. The conditions in gynecological laparotomies, however, present greater difficulties. The peritoneal coverings of the genital organs that lie in the pelvis, as well as the broad and round ligaments, are innervated by nerves from the lumbar and sacral plexuses. It is therefore necessary in gynecological laparotomies to use a combination of the parasacral and paravertebral anesthesia.

The paravertebral anesthesia serves for the anesthetization of the abdominal wall, the peritoneum, and the relaxation of the abdominal wall; the parasacral anesthesia serves for the anesthetization of the pelvic peritoneum and ligaments.

For vaginal operations the parasacral anesthesia is usually sufficient. However, since the pelvic ligaments are innervated in part by the ilioinguinal, iliohypogastric, and femerocutaneous lateralis, and since the pelvic peritoneum is pulled upon, it becomes necessary to add a paravertebral anesthesia to accomplish perfect results. This, however, is necessary only when the operation includes the uterus and adnexæ.

Up to date the authors of this paper have done (September 15, 1915) 556 gynecological and 114 obstetrical operations with conduction anesthesia only—*i.e.*, with paravertebral or parasacral, or combined paravertebral and parasacral anesthesia. The cases include all the usual gynecological and obstetrical operations.

Novocaine in one-half-per-cent solution is used; this enabled the operator to inject large quantities of fluid before reaching the toxic dose. Since all the injections are perineural it is clear that the nerve is reached with greater certainty than with a smaller quantity.

The principle of paravertebral anesthesia consists in the blocking of the nerve immediately at its exit through the intervertebral foramen. The patient is placed in the sitting posture with the head bent slightly forward. The iliac crests are located by touch; the interspinous interval of the third or fourth vertebra lies on a level with a line connecting these points. In a similar manner the angles of the scapulæ are located; the spine of the sixth or seventh vertebra lies about on a level with a line connecting these points. The intermediate spinous processes are then marked off, and a line parallel to the midline is drawn on both sides of the midline and four centimeters out. The needle is now introduced vertically down on the rib on a level with the spinous process; the rib next in number to the spinous process is thus touched.

If the lumbar nerves are to be blocked, the transverse processes are used as guides instead of the ribs. After locating the rib or transverse process with the point of the needle, the needle is raised and inclined outward about ten to twenty degrees and pushed from two to three centimeters deeper, so as just to pass the lower border of the rib.

Now 15 Cc. of a one-half-per-cent solution is injected into each intercostal space, and in such a manner that at the beginning of the injection the needle lies deep, and is then gradually withdrawn so that at the end of the injection the point of the needle is on a level with the surface of the rib; and the whole area from the point of beginning the injection to the end of the injection is infiltrated with anesthetic fluid.

They use for the injections a needle six centimeters long for the thoracic nerves, and eight centimeters long for the lumbar nerves, as described by Braun.

For the parasacral anesthesia the patient is placed in the lithotomy position with slightly raised pelvis.

The needle is introduced at the points marked off on a level with the tip of the coccyx and pushed forward till an obstruction is met. This usually happens at a depth of 7 to 8 centimeters, and the needle point is then at the second sacral foramen. Now 25 Cc. of a one-half-per-cent solution is injected after withdrawing the needle one-half to one centimeter. Then 35 Cc. is injected while the needle is gradually withdrawn to the skin; the third, fourth, and fifth sacral foramina are thus injected. The needle is then completely withdrawn, and introduced again at a slightly greater

angle with the sacral axis and parallel to it sagitally until an obstruction is met; now the point of the needle is at the first sacral foramen and about 10 to 12 cm. deep. After withdrawing the needle about 1 cm., 20 Cc. of a one-half-per-cent solution is injected. Finally the needle is entirely withdrawn, inclined well outward, and pushed between the tip of the coccyx and the rectum. Here 5 Cc. is injected to block the anococcygeal nerves.

The whole success of conduction anesthesia depends on an exact knowledge of the innervation of the field of operation. As is well known, the viscera themselves are not sensitive; likewise the sympathetic nerves are not sensitive to pain. The skin, fascia, and peritoneum are sensitive to pain; also pulling on the mesentery causes pain. In spite of the correct anatomical localization of the nerves our clinical knowledge of their distribution is rather primitive.

A PLEA FOR A COLLECTIVE STUDY OF TETANUS.

MacConkey (*Journal of the Royal Army Medical Corps,* March, 1916), after quoting a number of widely varying opinions and equally widely varying results, states there is a general agreement in regard to several points, namely, that the patient should be kept as free as possible from all disturbing stimuli: room darkened, mattress on the floor, patient's head wrapped in cotton-wool, thick carpets, non-rustling dresses, and felt slippers for nurses, etc.

Every means should be taken to sustain the patient's strength. When enough food cannot be given by the mouth or rectum, it has been suggested to give a solution of glucose intravenously. Barbee's (1914) experience might possibly prove useful on occasion. After careful observation of 150 cases, he thinks that sugar solution by proctoclysis is a valuable adjunct in postoperative treatment. Sugar water is rapidly absorbed by the rectum. Fifteen grammes of sugar to one liter of water should be administered by the (Murphy) drop method—thirty to forty drops per minute. The rate may be increased or diminished according to the patient's need. Three quarts may be thus given in twenty-four hours. In two cases of gastroenterostomy the solution ran continuously for seven days. No other form of nourishment was given. The patients did not complain of the slightest hunger, kept their weights, and no sugar appeared in the urine.

The only specific treatment is by means of tetanus antitoxin.

Experimentally MacConkey failed to find any beneficial effect accruing from magnesium sulphate in the horse. Zilva tried guinea-pigs with phenol and iodine and failed completely. No encouraging results were obtained from iodine.

Dönitz's experiments show that not only could life be saved, but in some cases by increasing the dose of antitoxin the development of the disease could be prevented, always providing the treatment be taken early. Even enormous doses are of no avail if delay be too long. Also it seems there is a limit to the use of the antitoxin which can be made use of, for even when the blood contained fifty U. S. A. units per cubic centimeter, which means that there was in the body enough antitoxin to neutralize more than one and a half million minimal lethal doses, yet the animals succumbed to the effect of one single minimal lethal dose.

The individual idiosyncrasy in animals is pointed out and has negatived many experimental results. The experimental evidence seems to show that if toxin be injected intramuscularly even intravenous injections of antitoxin are without effect, and that the only way to combat "intramuscular toxin" is by means of "intraspinal antitoxin."

In Permin's hands it was found that with the dose of toxin employed, antitoxin had to be given intraspinally within six hours of the toxin in order that it might have effect. In his hands intraspinal antitoxin did not save life when given after tetanus was manifest, but he does not mention the amount that he gave. On the other hand, Park and Nicoll have been more successful. The

author believes there is no doubt that the best use that can be made of tetanus antitoxin is to give it prophylactically; then it is reliable and, as the dose is small, economical. When used curatively the amount given must be very much larger, and even then one cannot foresee the result with any certainty, as with the same dose of antitoxin, given under apparently exactly similar conditions, the result may be in one case recovery, and in another case death.

The treatment of tetanus is indeed a complicated question, the answer to which can only come from a joint effort. If all those who have wounded soldiers under their care will combine to study the disease, and each give their help toward deciding upon the value of (1) the various premonitory symptoms, (2) the intraspinal method of administration, and (3) large doses of antitoxin, it is quite possible that we may make good progress in the direction of solving the problem of the successful treatment of tetanus.

DRESSINGS USED IN A CASUALTY CLEARING STATION.

Don (*British Medical Journal*, May 6, 1916) observes that among the many methods of dressing wounds one comes across none which are really new. A dip into a good text-book in use say in the early part of the last century will convince any skeptic of this.

Wright's saline treatment has received perhaps more praise than any other. In theory it seemed excellent, but in practice the results are various. When used properly and in suitable cases they are good, but the cases require careful selection, and its application requires more skilled watching than can usually be given with the means at one's disposal so near the front. The method and choice of cases cannot be left to the discretion of a dresser or even to the average medical man attached to a casualty clearing station, and if used as a routine dressing the results are more often positively bad than passably encouraging. In the majority of places where hypertonic salines are used as a routine dressing they are either too long continued for bad lacerations or are applied to many cases almost clean, where they are unsuitable.

To living tissues strong salt solution is extremely irritating, and causes pain for a very considerable period after each application. This does not depend on the patients. The action of salt on wounds was well known in history, when it used to be rubbed into the cuts made by the lash, not for its healing power be it noted. The author has personally experienced its smart, for it was a favorite dressing in hypertonic solution in his boyhood. He owed the preservation of a perfect finger-joint to its use, yet he well remembered the happy change to a soap and sugar ointment which completed the treatment.

The hypertonic method does well for joints, when they have not been laid open too freely, and probably lacerated wounds where the explosive force of the missile has killed the tissues for a considerable distance beyond the bullet track. The salt preserves these dead tissues from putrefaction (a well-known use of salt), for it is an absolute bar to the growth of putrefactive organisms, while its irritating effect on the living tissues sets up a more or less severe discharge, which helps to prevent the ingress of pyogenic germs. But such a dressing should not be covered by non-permeable tissue, which will check entirely such outward flow of serum. The tabloid and gauze pack is perhaps the best for dirty wounds in casualty stations, as it can be left for a considerable time without attention. There is at first practically no pain following its application, for even the tissues that will ultimately live are rendered analgesic by the blow. But once the dead tissue separates, and the hypertonic dressing becomes painful, it soon produces purplish, waterlogged, shining granulations, which at one and the same time form a barrier to the exit of discharges, and to any feeble antiseptic action it might exert on the cooped-up pyogenic germs below.

When the wound shows the purplish granulations described, and when the patient complains of the smarting, and in all

wounds where the exposed surfaces are living tissues, hypertonic solutions are contraindicated. The saline method of Wright requires careful watching by the surgical specialist, who must see every case so dressed daily. It is not, therefore, suitable for routine work in a casualty clearing station, nor even in a base hospital. The writer says nothing of the normal saline, with which every one is familiar.

Hypochlorous acid has been used in the forms eusol and eupad. The deodorizing effect is sometimes magical. The dry eupad so used is very caustic and very painful, and should only be applied by the surgeon himself. Eusol solution, on the other hand, is seldom painful, and is a good routine application, but some skins are very susceptible to it, and it must not be applied for long periods to wounds of the back of the hand, dorsum of foot, and of the neck, forearm, and wrist. It should always be freshly mixed, applied once or exceptionally twice daily, and should not be covered by protective. The drip method is specially useful in compound fractures, and in all lacerated wounds of the limbs where there is gas gangrene and foul-smelling sores. Eusol is one of the best methods, and it need not be continued after the wound is fairly clean and free from smell. A sterile dressing is then quite sufficient.

Iodine in spirit or watery solution acts pretty much like hypochlorous solution as a deodorant, while the spirit preparations act like the hypertonic salines, by inducing a serous flow. Iodine is very irritating to most skins, and the pain continues for some time after the dressing is applied.

Methylated spirit or glycerin, alone or charged with antiseptics—for example, biniodide spirit, glycerin, and ichthyol—both act like the hypertonic saline in producing free discharge, and require frequent changing. They do not cause so much pain, but are expensive to use in routine work.

Carbolic acid, when used pure, cauterizes the surface, and is only feebly antiseptic, as its combination with albumin dams back all discharges. It is a useless application where there is deep destruction of tissue. It runs over and destroys the skin, and cannot be recommended as a first treatment for wounds of any kind. In solutions of 1 in 60 on double cyanide gauze it is quite good in a rush. Large quantities of the gauze can be kept moist in this solution in small enameled marmites, and this method is specially useful in busy times. It is painless, can be applied to most wounds indiscriminately, and the dressing can be left entirely to nurses and even to orderlies in emergencies without risk. But carbolic is a weak destroyer of putrefactive organisms. The greatest danger in its application is the wringing of the gauze with the bare hand; this can be avoided by gloves or by applying the dressing moist with sterile forceps.

Dry sterile gauze and the double cyanide gauze are both good dressings for visibly clean wounds, and if removed by hydrogen peroxide when too adherent are suitable for dressing such cases, and convenient for rushes. They are safer than moist dressings when applied with the bare hand carelessly.

Hydrogen peroxide cleans a cavity or surface quickly, and is a good deodorant, but is not satisfactory as a wet dressing applied on gauze. The under layers become clogged and non-absorbent. It is a weak antiseptic, which at once produces its total effect if thus applied. Like protective, it checks drainage of discharges and promotes absorption. Its mechanical effect is practically its only recommendation as a lotion for dressing. It is quite good as a bath for foul-smelling wounds, either alone or with boracic.

It is not so much the antiseptic dressing used as its intelligent application that matters. Almost any one of the methods will give average good results, but there are cases in which one application is more suitable and more easily applied than any of the others, and it is here that the specialist in surgery in a casualty clearing station comes in. He should never become an enthusiast in any one method of dressing, as he is then a danger to his patients and an embarrassment to his colleagues, to whom freedom of choice is as necessary to secure their intelligent interest as a change of

method of dressing may be to the patient. No surgeon or dresser in a casualty clearing station should try to drive a one-horse shay, and so become a menace to the recovery of not a few of his patients.

FINAL RESULTS IN TWELVE CASES OF COLECTOMY.

CLARK (*Surgery, Gynecology and Obstetrics,* May, 1916) observes that in only six of the twelve cases operated on may one consider the result as entirely satisfactory.

In all cases there has been great improvement in the constipation for a time, to be followed at variable intervals in four by a gradual recurrence of the constipation. In some cases this has not been so severe as formerly, whereas in others it is quite as intractable. *X*-ray examinations in three cases showed in two decided dilatation of the ileum to a size closely resembling that of the colon.

In none of these cases has there been diarrhea of long standing, and none in which it was not controlled by simple medicinal measures.

In none of the cases has there been undue thirst.

In six cases there has been marked improvement in nutrition. In the remainder there is no visible effect so far as physical improvement is concerned.

As a final summary of these cases, total removal of the colon is justifiable only in severe instances of obstructive constipation. Usually a less radical procedure should be employed, and the colectomy should be limited to the ascending and right half of the transverse colon, with a lateral anastomosis of the ileum in the transverse colon. Thus the omentum is preserved, and there is far less traumatism to the mesentery, with its very important sympathetic nervous system.

From Clark's experience in one case alluded to in this series, and in two or three others in his case records, he is convinced that any form of anastomosis between different segments of the colon or between the cecum and sigmoid flexure, with the expectation of diverting the fecal current into this new channel, is doomed to failure.

The one valuable point gained in the study of this series of cases of colectomy is that the ileum will not uniformly assume the vicarious function of the colon, and that the backward pressure from the colon through the anastomotic opening, when it is low down, in a definite proportion of cases causes dilatation and permanent impairment of the ileum.

If a technique can be devised that will prevent the reflux into the ileum it will serve a useful purpose in obviating one of the objections to an extensive colectomy. In severe cases of obstructive constipation it may be a very efficacious operation if carefully restricted and may be added to our surgical therapeutic list. The immediate danger of the operation and the serious sequelæ that may follow weeks or months later make it too hazardous to extend it into the wider fields so ardently advocated by Lane and his enthusiastic followers. It may be efficacious, but it possesses no miraculous function.

THE NOTIFICATION OF VENEREAL DISEASE IN SWEDEN.

The *Lancet* of March 18, 1916, states that the proposal by the Swedish Royal Commission on Venereal Diseases to make compulsory notification a more effective measure than has been the case in the past appears to have provoked trenchant criticism exactly illustrating these difficulties. One of the greatest objections to such a system is the invidious position in which it places the medical man, who is confronted with the choice of disobeying the law or violating his patient's confidence on a point requiring discretion and good faith. According to one proposal by certain members of the Commission, it should be incumbent on the medical profession to extract from the patient the conditions under which infection occurred. Neglect of this inquisition, it is further suggested, should be punishable. No doubt in many cases it is feasible for a medical man to make discreet inquiries of his patient as to how he con-

tracted venereal disease; but in many other cases were these inquiries made compulsory tactful handling of the situation would be impossible.

The Commission is reminded by one of its critics that the relations between patient and doctor are so delicate that they can satisfactorily be maintained only on the basis of strict professional secrecy. Any regulation at variance with a medical man's conscience and good taste must be discarded. The Commission is further reminded that in other countries where legislative reforms have ignored the conscience of the medical profession opposition has been effective enough to make the provisions of the law a dead letter. In order that the tracking down of sources of infection may be facilitated, it has been suggested that the patient who reveals the source of infection should himself be immune from the discomfort and restrictions following notification. He is to be shielded in every respect, his identity is to be concealed, and even if his information is misleading, he is to be immune from the consequences of denouncing an innocent person to the authorities.

Not only do these proposals place an effective weapon in the hands of the blackmailer, but they are also calculated to get members of the medical profession into serious trouble. For while the informer is protected by anonymity, the luckless medical man, who has been made the informer's tool, is exposed to the attacks of the innocent victim of the informer. The immunity which it is proposed should be conferred on the informer is regarded by many of the Commission's critics as most objectionable and unjust. It is quite unfair that the informer should be allowed to discontinue medical treatment at will, while his victim, who may not even be infected with venereal disease, is subjected to compulsory examination and, if infected, to compulsory treatment. With a little adroitness the worst sources of infection, by turning informer as occasion required, could escape every restriction imposed on their relatively harmless dupes. As for the relation of medical men to such a system of notification, it is exceedingly probable that when it is learned that they are bound to notify venereal disease and track down sources of infection, many an infected man and woman would give misleading information. It has been suggested that the Commission's proposals should be modified so that the medical man consulted by a patient should not be forced at once to notify the source of infection, but should attempt to get into touch with this source himself and institute treatment on his own account. Only when he failed in this matter should he notify the case to the health authorities.

A CONTRIBUTION ON FRACTURES OF THE NECK OF THE FEMUR BASED UPON ANATOMICAL AND CLINICAL STUDIES.

LANG (*Deutsch. Ztschr. f. Chir.*, 1916, CXXXV, 101) says that it is useless to attempt to cure ununited fracture of the neck of the femur by wire sutures or bone pegs. The poor result is the unavoidable consequence of the anatomical conditions. The occasional bony union obtained is only the result of accident, and is due to the fact that the vessels running in the epiphyseal line were not destroyed.

After suture of fractures in the middle of the femoral neck, bony union is almost sure to fail. Upon the basis of Lang's anatomical studies the best treatment is to extirpate the head of the femur. He found that the chief cause of pseudoarthrosis, neoarthrosis, and shortening of the neck was to be sought in the demonstrated inadequately nourished femoral neck, since it is itself poorly provided with blood-vessels. The blood supply of the neck of the femur in adults depends upon two circulations. The number of blood-vessels in the one is limited; they run in the epiphyseal line and extend from there to the femoral head. The blood-vessels of the other circulation are abundant, break up into branches in the trochanteric fossa, and extend from there into the lateral part of the femoral neck. Because the vessels of the median and lateral portions of the neck barely anastomose a considerable portion of the middle of the neck is free of blood-vessels. The Kocher

method of extirpation of the femoral head is the only rational operative treatment of non-union of a fracture of the neck of the femur.—*American Journal of the Medical Sciences*, May, 1916.

REPORT ON THE RADIUM TREATMENT AT THE ROYAL INFIRMARY, EDINBURGH, DURING THE YEAR 1915.

TURNER (*Edinburgh Medical Journal*, March, 1916) observes that myeloid sarcomas in particular yield very readily to radium, and when they are so situated as to be capable of being efficiently rayed the complete disappearance of the growth may be anticipated. Of the carcinomas, those situated in the vagina or cervix appear to be vulnerable to radium, and if localized can in many cases be entirely removed. Recurrence after a variable interval is the rule. A preliminary curetting is often of service. Radium in such cases should not be screened excepting by such coverings as may be necessary to protect it from injury or to protect the sound tissues. Considerable doses of 3000 or more milligramme hours are required.

The beneficial action of radium in rodent ulcers is now generally acknowledged. If uncomplicated and situated on the skin they invariably do well and a cure is expected. If they recur they may readily be removed by a second application, nor is there often any subsequent contraction in the skin. The point of importance is in the region of the orbit. Cases are benefited both in general health and in the special symptoms, even though there may be no actual reduction in the size of the affected gland. To avoid injury to the skin small doses should be given to different areas, and the softer rays should be cut off; but where, as in hospital practice, time has to be economized, only very penetrating rays filtered through silver 1.4 mm. thick and with the radium salt maintained at a distance of 2 cms. from the skin should be used. Twenty milligrammes of pure radium bromide can under such conditions be applied for twelve hours without damaging the integument, and the patient can now be sent home for two to three months before making a fresh application, for the beneficial effect takes time before it is fully produced. Thus the treatment is short and simple, the dose can be accurately gauged, and the excitement to be avoided in such cases of having to face a working *x*-ray tube is obviated.

Radium will cause the disappearance of papillomas, nevi, and recent keloids.

AS TO THE NECESSITY OF JOINT TUBERCULOSIS.

RIDLON (*Chicago Medical Recorder*, May, 1916) observes that the trend during the past ten years among the younger orthopedic surgeons has been more and more toward operative work, and it has been repeatedly stated in public discussions by men of position that radical operations are imperative in all joint tuberculosis in adults. One professor of orthopedic surgery said with great emphasis, and early and often, that he had never seen a case of knee-joint tuberculosis recover without operation. To controvert this opinion Ridlon publishes the case of a school-teacher who, having been in perfect health, fell ill in November, 1893, continued to teach for a year, and in 1894 went to Johns Hopkins, where she was given five iodoform injections into the joint in ten weeks. Then the joint was excised about three months later. Just before leaving the hospital trouble began in the other knee, and she was told that the condition was the same as in the first knee, the treatment would be the same as in the other—iodoform injection—and if it did not recover the joint would have to be excised. She then consulted several New York specialists, who agreed. She was then referred to Dr. Ridlon, who found some thickening of the joint capsule, some tenderness on palpation, but no restriction of motion. She wore a Gibney brace for a year. The thickening of the capsule increased, and the knee lacked from ten to fifteen degrees of full straightening. When sitting on a table the back of the knee could not be brought nearer than three finger-breadths to the table. Flexion was nearly

normal. There was pain. Three other specialists then examined the patient and advised iodoform injections. Ridlon applied a plaster splint from the ankle to the perineum, and renewed four times a year for over two years. The patient then gradually began to regain the use of the joint, and for the past sixteen years has had a normal range of motion and a joint appearing normal in every way.

In 1914 Ryerson examined her and could find no evidence that the left knee had ever been diseased.

The second case was a girl 5½ years old, limping for a year or more. She had not walked for eight or nine months. The tibia was slightly subluxated on the femur. The knee held flexed about 20 degrees could be flexed to nearly a right angle and nearly straightened, and there was considerable lateral motion and soft crepitus. Both excision and amputation had been advised by eminent surgeons. Treatment was by fixation and supporting splints. Five openings were formed and the sinuses discharged for many months. After three years or more she was cured with a straight leg, and by the end of four years she ran without limping and could flex the knee almost completely—far enough to take the foot in her hand below the buttock when standing on the other foot. Ridlon is convinced that the worst result he had by conservative orthopedic treatment, provided the knee be made straight, is better than the best result that is ever had from operation.

If any operation is ever done in children it should be amputation as a life-saving measure. In the growing child Ridlon has seen the growth of the limb arrested by excision to the extent of nine inches. In adults excision may at times be done as a time-saving measure, provided one realizes that only about half of the excised knee-joints are cured by the excision, and if not cured must be amputated later on.

REVIEWS.

DISEASES OF THE EYE. By George E. de Schweinitz, M.D., LL.D. (Univ. of Pa.). Eighth Edition. Reset, with 386 Illustrations and 7 Colored Plates. Philadelphia and London: W. B. Saunders Company, 1916. Cloth, $6.00 net.

With the appearance of a new edition of this well-known text-book, a decided departure has been made in the appearance of the work, the familiar green-backed volume of former years, grown somewhat bulky and misshapen with its natural growth, being replaced by a volume of much better proportions, with pages slightly wider and longer, and with a maroon-colored binding. The entire work has been reset, many new illustrations added, and all the chapters revised to include important ophthalmic observations and therapeutic measures which have been made and recommended during the three years since the appearance of the last edition. These include a revision of the text of the chapter on iritis, with special reference to autotoxemic iritis and iritis secondary to mucous membrane infections; a description of corneoscleral trephining, ordinarily known as the Elliot operation, prepared by Lieut.-Col. Elliot; and a revision of the description of the method of locating foreign bodies within the eyeball by the Roentgen rays. A new feature of this edition is the introduction of the metric equivalents of the doses of the remedies and the strength of the solutions, previously recorded only according to the old system.

The subjects which appear for the first time in the book include: Clifford Walker's Method of Testing the Visual Field; Squirrel Plague Conjunctivitis; Swimming Bath Conjunctivitis; Anaphylactic Keratitis; Family Cerebral Degeneration with Macular Changes; the Ocular Symptoms of Disease of the Pituitary Body; Sclerectomy with a Punch (Holth's Operation); Preliminary Capsulotomy (Homer Smith's Operation); Iridotasis (Borthen's Method); Thread Drainage of the Anterior

Chamber (Zorab's Operation); Extraction of Cataract in the Capsule after Subluxation of the Lens with Capsule Forceps (Stanculeanu's Method, Arnold Knapp's Method); Capsulomuscular Advancement with Partial Resection (Ziegler's Method); Tenotomy of the Inferior Oblique; Window Resection of the Nasal Duct (West's Operation).

Apart from the improved general appearance of the new edition, and the addition of the advances which have been made in recent years, the work calls for no extended notice, as it has long occupied a prominent place among text-books on the eye from its recognized completeness and the admirable manner in which its eminent author has arranged and presented the subject-matter of the different ocular affections. W. M. S.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

So far this month has been remarkably unseasonable, in that we have have had much colder weather than usual without having a great deal of rain. For some reason the sun has persistently kept out of sight. Many people have not been able to do without a fire in the evenings, this being in itself a serious item of expense when taken in conjunction with the price of coal, which is more than 50 per cent above the pre-war prices. A small saving is made owing to the Light Saving Bill, and it is possible to read comfortably by daylight until 9.30 or even a little later. Now that the regulator is introduced everybody seems quite satisfied, and the only remarks heard in connection with it are those expressing wonder that the change was ever resisted in former years. Coal is only one of the articles which have risen in price. In comparison with the prices in July, 1914, meat is up between 50 and 60 per cent, and bacon nearly 40 per cent, while the price of fish is at the present time nearly double what it was then. Sugar costs about two and a half times as much as formerly, and milk and butter have risen about 30 per cent. Bread, up to the end of last month, cost twice as much as formerly, but during the last month has fallen, and judged by the price of corn will probably fall further still. There seems, however, to be a reluctance on the part of the retailer to reduce the price in proportion to what the wholesale price of corn indicates.

The rise in price of meat was very clearly brought home to me a week or two ago, when the question was raised at the board of management of a hospital. When taken by contract the prices are naturally most favorable, but at the present time the butchers refuse to make contracts for more than a month in advance. The lowest contract obtained showed a rise of between 85 and 100 per cent of the contract price of 1914. In considering the cost of living it is of course to be noted that the greatest advance of prices has occurred in articles of diet. Rents have not been allowed to be increased except when vacancies arise. Clothing has not advanced to a great extent, but boot leather is about 25 per cent more than formerly. The gas and electric light companies have advanced their prices about 10 per cent. In some cases the rates have tended to fall, but of course taxation has increased very largely. It is estimated that the total cost of living has risen about 40 per cent, this of course not including increased taxation and allowing that the mode of life is continued on a par with pre-war standards.

On the whole complaints are not very much heard. The altered conditions weigh most upon those with fixed incomes, and especially upon those who have retired on a pension and have settled down, and are unable to alter either their domicile or their mode of life. Flats are in great request

and small houses let very rapidly. The larger houses remain empty, and there is no chance of letting them as they become vacant. In the same way shootings and fishings are quite unlettable. In the further world of sport race meetings are very sparsely attended and considerably restricted in number. Golf courses have become the property of those who are retired and are over fifty, and cricket grounds would be entirely deserted were it not for the matches which take place between the various schools. The prevalent conditions have affected the various watering-places in different ways. Those on the East Coast are feeling the stress very badly. Under ordinary circumstances these resorts are patronized from May to October, but this year few visitors are to be found at these seaside localities. People have been scared from visiting the Norfolk and Suffolk coast especially since the last bombardment in the spring. On the other hand, the south coast districts are doing remarkably well, and their prices have advanced by 20 per cent. The same is true for the west coast. The west and south coasts were formerly not nearly so popular as the east coast for the summer holidays, but owing to the present conditions the future will probably enhance the popularity of the former to the general advantage of the visitor.

There is very little to record in connection with the truly medical news. The London hospitals do not seem to contain more if as many of our soldiers. The probable explanation of this is that cases are being distributed more widely over the country and are consequently being sent less to London than formerly. The type of case has not altered much, but a greater proportion of cases of shell shock have come under my care than were present in former times. There are also a number of the so-called soldiers' heart cases, most of which seem to improve fairly rapidly, but some are very resistant. I have also had several cases of older men who complain of various pains, chiefly in the lower extremities, such as joint pains and pains in the tibiæ. No swelling can be detected, and evidence of neuritis is not to be obtained. The most constant feature of this type is that they have lost considerably in weight, sometimes as much as one-fifth. The pains do not disappear until the greater part of this loss has been regained, which naturally takes time, and which is also associated with a long period of rest. Most of these cases occur in men from forty-five onward. What ultimately happens to them I do not know.

There has recently been some general discussion on how far operations on soldiers should be obligatory. This was raised especially in connection with operations on the wounded. As a matter of fact, as far as my experience goes, the wounded never object to any operation. It is quite easy to consider cases in which the refusal to undergo an operation for amputation might quite well be justified. I think the general rule has been that where such an operation has been refused the question has not been pressed. Since universal service has been introduced, the question assumes greater importance. In former days the man who offered himself for the army and suffered from hernia, as an example, would be rejected, unless the condition was cured by operation. As a matter of fact those who offered themselves for enlistment would have such an operation, and when cured were admitted to the army. The candidate is, however, perfectly entitled to refuse such an operation, and is therefore not accepted. Theoretically, under the conditions of universal service such a man might refuse to be operated upon and then escape his military service, and the question arises whether he ought not to be obliged to undergo the operation in order to fit himself to become a soldier and thus take his part in the general defence of the country. Compulsory operation has not been introduced, but the individual can be relegated to other classes which would not be going on strenuous foreign service. I understand that this is actually done, and there seems to be no practical reason why such an individual wearing a truss should not enter one of the branches of the service

which does not entail so much physical strain, though of course the presence of such a condition is a peg on which a malingerer can hang his hat. At the present time, however, there is not a great deal of malingering.

The annual Parliamentary review of the working of the National Health Insurance Act brought to light some interesting facts. Over 50 per cent of the permanent staff employed in the working of this act have been recruited either for the army or to be transferred to other government departments, and similar reductions have taken place in the staffs of the associated and approved societies which are affiliated. One hundred and thirty-three women have been employed as substitutes. This reduction, however, has produced a negligible decrease of the salaries paid, because the employees continue receiving their previous salaries less such an amount returnable by them, as is received in payment of military service. Several vacancies which have occurred among the higher officials have not been filled. On the other hand, the new employees have to be paid at the ordinary rates. It is satisfactory to see that the Annual Approved Grant diminishes each year. In 1914 this grant amounted to over seven and a half million, in 1916 it will be less than six and a half million. The grant which was formerly given to assist members for penalty arrears will also be reduced, and will during this year only be applicable to those employed in one of the military services. In the case of those who do not fall in this category the grant is withdrawn on account of the enhanced wage which is being received. The ultimate effect of the war on the finances of the act is uncertain and somewhat speculative. At the present time the expenditure connected with sickness and maternity benefit are both diminished. As regards the future, it is hoped that the improved physique resulting from military service will outweigh the sickness arising from the strain endured, but it is at present impossible to see what the balance will be. Owing to a number of premature deaths a certain amount of the reserves will be released before their expectation. Better wages resulting in more favorable food supply accounts for a diminished rate of sickness. The finances of the act will also be improved owing to the high rate of interest obtainable at the present time. A government grant of £135,000 is being asked for to provide a sickness benefit, which has arisen in consequence of the large number of women employed at the present time. The money now invested in the name of the National Health Insurance Committee amounts to twenty-eight million, and £200,000 a month is being invested in the war loan and other government securities. The report further shows that the number of cases of tuberculosis applying for treatment and the number to whom that treatment has been extended have increased. This does not necessarily mean that the number of cases of tuberculosis has increased, but more probably that the facilities for treatment under the act are better recognized and becoming more widely known. In this connection it should be pointed out that the act naturally only deals with those cases of tuberculosis arising in the insured. The local public health authorities are responsible for the treatment of such as are not included in the National Health Insurance Act. The government pays 50 per cent of the cost of treating such cases. The authorities who control the act are believed to consider that the medical men are overpaid for the work that they do in connection with the act, and it is obvious that the terms of the medical practitioners will be reconsidered in the near future. Had so many medical men not been away on military service, it is likely that such a consideration would have taken place this year. Under the prevailing circumstances this is manifestly unfair, and no alterations are to be made at the present time. It would be very much wiser to defer such a consideration until a few years after the end of the war, as it is impossible to prophesy the alterations which will occur in the national finances and the circumstances of the individual.

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ORIGINAL COMMUNICATIONS.

SOME PHASES OF AURAL DISEASE.[1]

BY S. MACCUEN SMITH, M.D.,

Professor of Diseases of the Ear in the Jefferson Medical College of Philadelphia.

Although many of us have agitated the question for a number of years, it is still apparent that an incredibly large percentage of the medical profession possesses a very meager appreciation of the danger-signals of aural afflictions.

Formerly, on account of lack of knowledge of the ear and its diseases, this apathetic attitude was comprehensible, but considering the widely disseminated educational campaign of recent years on pathologic otology, I feel that we have not achieved a success commensurate with our efforts.

Two principal reasons seem to be responsible for this indifferent attitude both on the part of some members of the profession and of the public. The latter is well illustrated by the old adage of our forefathers of some generations ago, born of their ignorance of the subject, that it is dangerous to interfere with a discharging ear; the second more important reason why this false impression still lives and struggles so tenaciously for its existence is due to the fact that some aurists yet adhere to the ultra-conservative method of treating acute suppurative diseases of the ear. We are all aware that occasionally a case, though presenting more or less alarming symptoms, will effect a spontaneous cure without operation. However safe this practice of "watchful waiting" may be in the hands of an expert, I believe it most dangerous to follow as a routine method of treatment even for the usual skilled aurist. The truth of the matter is that even with the aid of Roentgenography we are many times unable to estimate the exact degree of destruction taking place in an acute suppurative inflammation of the organ of hearing, or the direction in which this destructive carious erosion may proceed. Therefore, it seems most unwise to wait until grave symptoms, probably indicating an intracranial complication, present themselves before resorting to operative intervention.

I do not wish to be understood as advocating, for instance, a mastoid operation in cases of acute inflammation without making every effort for their non-surgical relief, but I do consider it unfortunate to wait purposely until there occurs a carious erosion through the cortex or through the tip, resulting in the characteristic swellings, before operation is advised.

Modern aseptic surgical otology has rendered the mastoid operation, if performed early, probably the most successful procedure in all surgery. Furthermore, early surgical intervention will not only prevent the various intracranial complications, in most instances, but will also almost assuredly preserve the hearing.

Some phases of this subject are forcibly illustrated by a few interesting cases which I will briefly recite.

In former years, when a diagnosis was doubtful, it was convenient for the medical profession to designate many such cases as malaria. In more recent times this mala-

[1]Read before the American Otological Society, Washington, D. C., May 9 and 10, 1916.

rial incubus has been banished, through the enlightenment of the popular mind, only to be replaced by the omnipresent influenza, a term at present quite acceptable to the public even though the condition be non-existent, and to-day we have the bacillus of Friedlander arraigned at the bar as indiscriminately as was formerly the supposed miasma of malaria.

The following case of brain abscess well illustrates the error into which physicians are liable to fall, owing to incomplete diagnostic methods:

Male, sixty years of age, enjoyed exceptionally good health up to six weeks previous to operation, which occurred three years ago. Patient complained bitterly of general head pain, which was somewhat relieved by exerting severe pressure with his hands. This condition continued for a period of two weeks without additional manifestations. During this time he was advised to remain in bed, but refused compliance. At the end of two weeks he gradually became stuporous, with occasional lucid intervals, and so remained until the time of his death, four weeks later. Two weeks before he died he was removed to the hospital to be kept under observation. At the onset of his illness he was supposed to be suffering from influenza, and later, on account of having chills every second or third day, his malady was diagnosed as malaria, but a blood examination failed to confirm this suspicion.

I was walking past this patient's room with the resident physician, and my attention being attracted by his labored breathing, I remarked to the resident that it sounded like a patient suffering from a brain abscess. I was informed that a diagnosis had not been made, although the patient had been treated for the two diseases above mentioned. The resident asked me to examine the man, but as the case was a private one I was unable to comply with his request. Two days later, however, a spontaneous rupture of the right membrana tympani occurred, followed by the same condition in the left ear early the next morning. At this time I examined the man, performed a simple mastoid operation on the right ear, and, on account of the great destruction, a radical operation on the left side. There were no exposures on the right side, but on the left we found a perisinus abscess formation, as well as a large carious exposure of the dura through the tegmen antri and tegmen tympani, well covered with granulation tissue, through the center of which pus escaped.

The interesting points in this case are that although the patient complained of severe head pains for a period of six weeks prior to the operation, he did not at any time locate this pain definitely in either ear. This no doubt was responsible for the failure to have an aural examination. The second point of interest is one of very common occurrence—the tendency, in the absence of an exact diagnosis, to pronounce an influenzal state the causative factor. It does not seem to be generally appreciated that confined pus within the tympanic or mastoid cavity will give symptoms simulating those of influenza, the result being that the ear, which is so frequently the only part of the organism involved, is entirely overlooked, showing the wisdom of a routine examination of the ear in a case of doubtful diagnosis. This is of especial importance in children. Indeed, a failure to examine the ear would seem to be almost criminal neglect in many instances.

It is quite true that in this case the aural involvement may have been secondary to an influenzal infection, but, granting this, it would not explain the chills and semicomatose state which were continuous during the last week of the patient's life and latterly attributed to malaria.

Inasmuch as this patient, as above stated, did not complain of actual aural pain, it is not amiss to emphasize to the general profession that there are two distinct types of acute aural inflammation: one in which the symptoms are frank and very severe; the other type in which the symptoms referable to the ear are almost *nil*, even in the presence of most extensive destruction, and yet in this latter class the existence of aural disease can be determined on examination by an expert.

The second case well illustrates the folly

of procrastination in some acute aural afflictions:

Male, seven years of age, contracted an acute suppurative otitis media, complicating a so-called "cold in the head." The ear was entirely overlooked for a period of two weeks, during which time the child suffered severely from general head pains, no aural trouble being suspected until a discharge through a spontaneous rupture of the membrana tympani was discovered by the nurse, the temperature ranging meanwhile from 99° + to 104°. The spontaneous rupture was in the superior anterior quadrant, and was therefore enlarged and the middle ear aspirated. The pain and fever were lessened for two days only, and during the following week ranged as heretofore. It was impossible, on account of the child's fretfulness, to determine definitely the presence of tenderness on pressure over the mastoid process.

On several occasions I suggested to the attending physician the advisability of performing a mastoid operation. He, however, on account of the importance of the child, who was the sole heir to an enormous estate, hesitated to assent to this suggestion. On the ninth day following the spontaneous rupture there appeared a distinct drooping of the superior posterior wall. A mastoid operation was then urged and again refused, the same reason being given. The following day the child's mentality seemed to me to be somewhat cloudy. It was asserted, however, that this was due to a wakeful night. At this juncture I advised the medical attendant and the family that unless they consented to operative intervention, I would no longer assume the responsibility of the child's condition. This attitude resulted in another consultant being called, who in turn gave as his opinion that he saw no reason for immediate operation, although he felt that one might be necessary eventually. This verdict was pleasing to both the child's physician and the family.

Eight days later I was summoned in great haste to see this child, being requested to bring my instruments with a view of immediate operation. On arrival I found the patient had been semiconscious for two days, opisthotonos was present, several severe convulsions were reported, the temperature ranging as high as 106° +, and death ensued within the next half-hour, without the patient having the benefit of surgical intervention.

With this history it is needless to state that the boy succumbed to a diffuse, purulent meningitis, all of which, to my mind, would have been prevented had an early operation been permitted for the evacuation of the infectious material.

The last case I shall outline shows another form of aural disease, not quite so common but just as grave:

Male, forty-one years of age, suffered from a chronic recurrent suppurative otitis media for thirty-eight years, the disease complicating an attack of measles at the age of three years. Until the last five years preceding operation the patient was not conscious of the slightest discomfort other than the annoyance of the discharge when present. During the last five years, however, he suffered almost constantly from what was termed a mild form of neuralgic headache, this at times becoming very severe. His general health was much impaired, to such an extent, indeed, that he was unable properly to attend to his large interests. This condition culminated in the patient being found unconscious in the drawing-room of a train between New York and Philadelphia. He was taken from the train to the hospital, where, on account of a foul-smelling discharge escaping from the ear and the absence of any other symptoms to account for his condition, I performed a radical mastoid operation. The cortex was ivory-like in density, the antrum decidedly small, and the sinus pushed far forward. The middle ear and antrum were well filled with considerable cholesteatomatous material and foul-smelling pus. The dura was exposed by carious erosion through the tegmen tympani, through an opening in which a quantity of pus escaped. With dilating forceps an additional amount of pus was evacuated from apparently the temporosphenoidal lobe.

This patient completely recovered in due course and returned to his duties, and only

recently expressed the opinion that he had never known what it was to feel really well and vigorous until after this operation. He has increased in weight and enjoys must excellent health.

Cases of neglected aural disease might be indefinitely enumerated not only in my practice, but in that of us all. My object, therefore, in presenting this elementary note is for the purpose of soliciting on the part of my colleagues a continuation of our educational programme.

THE CONSERVATIVE TREATMENT OF THE AFFECTIONS OF THE LACHRYMAL DRAINAGE APPARATUS.[1]

BY S. D. RISLEY, A.M., M.D., PH.D.,
Surgeon to the Wills Eye Hospital, Philadelphia.

"The ophthalmic surgeon meets with no more numerous, annoying, or persistent class of affections than those involving the lachrymal apparatus, especially that part constituting the drainage system." This sentence is a quotation from a paper on "Epiphora" presented at Denver, Colorado, before the Section on Ophthalmology of the American Medical Association in June, 1898. To-day I would not, based as then upon my personal experience, write in so pessimistic a strain. In other words, I wish to say that I have in large measure lost my former dread in undertaking the treatment of lachrymal obstructions.

My first independent study of the subject was presented before the Pennsylvania Medical Society at Lancaster, Pa., in 1877. Through the courtesy of the late Dr. Harrison Allen I secured a large collection of dried skulls and wet preparations exhibiting the lachrymal duct and its relation to the nasal passages. I was induced to undertake the study because of the unsatisfactory results I had had in the treatment of lachrymal diseases by the methods then employed, viz., by slitting the lower *punctum lachrymarum* and canaliculus for the more ready passage of a series of silver probes through the nasal duct to the floor of the nostril. The painstaking study of the anatomical features of the nasal duct in a large series of cases led very speedily to the conclusion that the treatment by frequent and, too often, violent probing of this nasal duct was responsible for the chronicity of the affection. The anatomical study at once revealed a great variety in the size and contour of the bony duct. The irregularities in the surface of the osseous walls of the duct in many individuals, it was obvious, rendered them especially liable to a ready obstruction of its lumen from even slight thickening of its lining membrane from any cause.

While the duct may be large and even abnormally capacious in some parts of its course, forming lake-like expansions, in other portions bony projections or irregularities of surface contract its diameters to a narrow channel or a mere slit; or produce a tortuosity of its course which explains the difficulty which is often experienced in passing a probe into the nose, even in cases in which fluids pass quite readily. The probability of these anatomic peculiarities being present in any case of lachrymal retention should always be borne in mind, and in the adoption of methods of treatment should suggest conservatism in surgical interference. Any violent effort to force a probe through the canal in these cases may very readily cause a traumatism far more serious in its results than the disease we are attempting to cure. If, for example, the canal is tortuous, or if ledges of bone project from its walls, the end of the probe is liable to infringe upon the bony surface, and attempts to force it onward are likely to cause a tear in the lining membrane which will allow the probe to pass between the soft tissues and the bone. If these tissues are already the subject of chronic inflammation and thickening, the acute exacerbation caused by the trauma-

[1]Presented by invitation at a symposium on Lachrymal Diseases, Polyclinic Ophthalmological Society, April, 1916.

tism and the accumulation of coagulated blood between the bone and mucous membrane lead to increased thickening and a still more complete retention of the tears above the obstruction. I believe that more or less serious injury is often done in this way by converting comparatively simple or temporary cases of retention into practically incurable obstruction of the duct. After this accident the most careful manipulation is required in order to prevent its recurrence at every subsequent attempt to probe the duct. When it occurs the grating of the probe against the bone and the subsequent bleeding are sufficient evidence of the accident, and no further attempt to pass the probe should be made until the wound has had sufficient time to heal. The duct should, however, be carefully and repeatedly cleansed by warm aseptic alkaline and slightly astringent solutions. In long-standing cases the lining membranes of the duct often seem not only thickened, but spongy and friable, so that it is extremely liable to be torn or perforated, especially if too small probes are employed.

The size of the probe to be selected is of much importance. The great variation in the size of the osseous duct in different subjects suggests caution at this point. If too large a probe is forced through the passage, not only may the inflamed and friable membranes covering its wall be torn away and driven before the end of the probe, but the fragile projections of bone which encroach upon its lumen may be fractured. This certainly can be necessary in very few instances, if ever, and the results following such violence may be of more serious moment than the original disease.

The forcible dilatation of the duct and cutting operations designed to cut through or break up supposed strictures of the duct are based upon a misconception of the physiologic function of the drainage apparatus. While its function is to drain the eye of tears, the duct is not, in health, an open drain-pipe through which the tears flow by gravity, but a delicate pump, the pumping force being the act of winking. This action is disturbed by any operation which opens widely the inferior and common canaliculus up to the entrance into the sac and converts the nasal duct into a permanently broad open tube. Moreover, it gives ready access from the nose to the eye, so that in the act of forcibly blowing the nose air and infectious contents of the nostril and duct are forced back into the conjunctival sac.

How then shall we treat affections of the drainage system leading to retention of the tears? This must be determined by the existing etiologic factors and the severity and stage of the disease. In a considerable percentage of cases it is associated with, if not dependent upon, disease or anatomical deformities in the nostril, which block the lower valve-like opening of the nasal duct near the floor of the nostril, back of the inferior turbinate scroll. This probable factor should be sought for in every case of lachrymal disease. In many cases the lachrymal retention is transient. It is not infrequently a part of the symptom-complex in acute coryza or so-called "colds in the head." We now know that these "colds" are infections or toxemias, and that all the mucous membranes, whether covering exposed surfaces, as the conjunctiva or Schneiderian mucous membrane, or lining closed cavities, as in the bony sinuses, eustachian tubes, middle ear, and mastoids, are involved in the systemic state we call a cold. It would be strange if the lachrymal drainage system should escape. Clinical experience, on the contrary, proves that it does not escape, but that because of the anatomical irregularity of the walls of the nasal duct it is peculiarly liable to be closed by the edematous lining membrane.

Frequent recurrences of the condition doubtless may lead to permanent thickening and more or less permanent complete closure of the lumen of the duct in portions of its course, especially in cases in which faulty anatomical conditions favor such a result. Then, too, attacks of catarrhal conjunctivitis, or blepharitis from eye-strain or other causes, may lead to a partial or complete closure of one or both puncta and prevent access for the tears to the lachry-

mal sac and duct. This is not an uncommon cause of retained tears. I have often seen irritable eyes occasioned by this partial retention, a condition readily overlooked, since in the quiet of the consulting-room the tears may not collect but suffuse the eyes at every prolonged attempt at near work, or on exposure to wind and cold.

In these groups of patients treatment is both simple and efficient. The dilatation of the punctum, with a suitable dilator, after the instillation of a few drops of a 2-per-cent solution of cocaine, and the irrigation of the sac and nasal duct with an unirritating alkaline solution, repeated if required for a few days, is all that is needed in most cases to effect a cure. If neglected more serious conditions may result. Indeed, it is probable that the marked cases of serious disease have had their origin in neglected cases of the type described. When the tears no not flow freely through the nasal duct, their retention in the lachrymal sac makes of it a suitable nidus for infection which results in the examples of mucopurulent or purulent dacryocystitis which we are so frequently called upon to treat, and which so often prove rebellious. The relatively simple measures of treatment so efficient in the incipiency of the disease are no longer sufficient. In their management, however, I wish to call attention to the fact that in the treatment of these purulent cases we are dealing with a dangerous surgical area. I know of one case which after persistent efforts to force an opening through the nasal duct resulted in death from infection of the cavernous sinus, and another which threatened a fatal issue.

These examples have caused me to dread the possible consequences of surgery in this area in the presence of purulent disease of the sac. My own procedure is to dilate the punctum and canaliculus and wash out with a suitable syringe the contents of the sac, which usually can be made with a little pressure to escape through the canaliculi, if not through the nasal duct. A 4-per-cent cocaine solution followed by 1:5000 of adrenalin solution is carried into the sac and allowed to remain for ten minutes and then repeated. At the same time these solutions are sprayed into the nose. After the physiologic action of these drugs it will often be found possible to carry an alkaline wash through the nasal duct. When this succeeds the sac and duct are then irrigated either with a solution of silver nitrate, 1 grain to 1 ounce, to be followed in a few moments by the alkaline wash, or by a light wine-colored solution of tincture of iodine. Failing in the attempt to pass fluids through the nasal duct, twenty-four hours later the treatment is repeated. In the meantime cold compresses in acute cases are directed at home, and frequent instillations of a mild alkaline and astringent wash to the conjunctival sac. If it is still found impossible to irrigate the nasal duct, the lower canaliculus is slit, being careful to avoid cutting the common duct. A fine ductile probe with a fine bulbous extremity is then passed into the sac and a careful but persistent attempt made to pass it through the nasal duct. Failing in this, a No. 3 or No. 4 of the Bowman's series is substituted. If it does not pass without great force, the attempt is abandoned and treatment continued. It is in my experience very rarely that these conservative measures do not sooner or later succeed. When accomplished the prognosis is good for a speedy recovery. The duct once rendered physiologically patulous, the more or less chronic inflammation of the sac recovers under the stimulating and sterilizing influence of the iodine solution, repeated as frequently as may be required.

Under these procedures the treatment of lachrymal disease has lost for me its former forebodings, and my office or clinic room is no longer infested by a group of chronic cases. I look back now with curiosity as I remember the clinic bench allotted to patients sitting with Bowman's probes in their tear ducts, often so numerous that there were not probes enough to meet the demand, whereas at present a visit daily to my clinic for three or six months would never disclose a single patient with probes in the tear ducts, and comparatively rarely even the use of a probe.

THE APPLICABILITY OF BACTERIAL VACCINES IN TREATMENT.[1]

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HISTORICAL.

Pasteur in 1880 began his work on induced immunity with the bacillus of chicken cholera and succeeded in immunizing fowls against the disease by means of attenuated cultures. His results demonstrated the principle of active immunization, but were of little practical value in treatment. The attempts of other investigators met with but slight success along these lines, and their efforts were turned more toward the isolation of the causative organism than to the induction of immunity. The discovery of diphtheria antitoxin by von Behring, in 1890, stimulated the study of immunization for purposes of cure and hastened the division of bacteria into the two classes according to the nature of the toxin produced. The trial by Koch of old tuberculin in the treatment of tuberculosis and the fatalities which followed the injudicious use of the method were a distinct discouragement to the study of active immunization and set its development back for several years. For some time following immunological studies resulted mainly in methods of diagnosis. Ehrlich in the late nineties assembled the phenomena of immunity as then known in his side-chain hypothesis and explained them by a single rational theory. Although since modified in some respects, it is the basis of our present-day serodiagnosis and serotherapy. Metchnikoff had in the meanwhile developed his phagocytic theory; while the observations upon which it is based are quite true, it fails to account in a demonstrable way for many of the facts as they are observed. It remains to-day to most minds as an accurate description of an incident in the acquiring of immunity, but not as a fundamental principle.

In 1904 Wright developed a technique by which he was able to satisfy himself that immunity in certain infections was due to the presence in the blood serum of bodies which he called opsonins, and which acted upon bacteria so that they could be more readily taken up and destroyed by the phagocytes. He also observed that this property of the blood serum could be enhanced by the inoculation of the patient with killed emulsions of the bacteria in question, and that this was followed by improvement or cure of the infection. By this work, although the bodies demonstrated were distinct from those described by either, he in a measure harmonized the theories of Ehrlich and Metchnikoff.

For some time treatment was carried on, using the opsonic index of the patient's blood as a control, but for various reasons this was discarded and the clinical features of the cases were relied upon as a check—in other words, the use of vaccines became empirical. In medicine, as elsewhere, each newly developed method may become a fad and consequently be abused. With certain exceptions physicians at present are of two minds in respect to vaccine therapy: either they are overenthusiastic and use vaccines in every diseased condition in which infection may reasonably be supposed to play a part and vaccines are recommended for it, or they are frankly skeptical and refuse to see any good at all from vaccine therapy. Between these two extremes there is a middle ground, and this paper was undertaken in the hope of outlining in a general way what this course should be.

The subject falls naturally into three divisions:

1. The selection of the case.
2. The selection of the vaccine.
3. The method of administration.

1. *The Selection of the Case.*—Writers on vaccine therapy customarily divide disease into acute and chronic, but seldom attempt to explain what they mean by the terms or to furnish data by which we may classify any given case. The question of the acuteness or chronicity of a lesion may be judged by either one of two standards,

[1]Read before the Georgetown Clinical Society, April 25, 1916.

the clinical or the pathological. Clinically, a disease may be considered chronic when an individual remains ill from it beyond the average time expected of a similar condition in other indivduals under like circumstances, an indefinite standard which makes it quite easy to determine when a disease is chronic or when one is acute, but leaves us no ground upon which to judge the border-line cases—the ones most difficult to classify. If we wish to use a standard based upon the pathological conditions which are set down as determining the point, we are confronted with a variety of possible circumstances which cannot be recognized from symptoms or signs or with instruments of precision, and we are again left completely in the dark. Not being able to acquire data by which we can accurately judge this point we must look to other things upon which to determine the suitability of a case for vaccine treatment. The ideal method would be a determination of the resistance of the individual and a knowledge of what would be required to overcome the infection, but since there is no adequate method of determining these points, we must seek other manifestations.

It seems rational to believe that the presence or absence of generalization of toxins in the patient's body may aid us in our determination. Theoretically, the toxins resulting from an infection may be the bacteria causing it, the products of their metabolism, elements derived from tissue destruction by the bacteria, or a combination of the three; in any case, their presence is made known to us by a symptom-complex of which elevation of temperature is recognized as the pathognomonic sign, while other signs and symptoms will vary according to the location and variety of the infection. If an infection is present and fever develops, generalization of one of the above-mentioned toxins may be taken for granted, and it may be assumed without fear of serious contradiction that the toxins are then present in sufficient amount to furnish adequate stimulation to the immunizing mechanism. If this is granted and we recognize that there is no means of estimating the quantity of this toxin present, it will be conceded that any vaccine administered will either be superfluous or of no avail, even if it does no actual harm. In immunizing animals against various bacteria and body cells, it is frequently noted that a slight overdose will make the animal very sick or may even kill him, while if the animal recovers from the effects, but little is gained in the degree of immunity produced. We believe, then, that symptoms of generalization of toxins should lead us to other methods of treatment. It may be urged that the bacteria producing the infection are not so constituted as to lead to the production of antibodies, and that this deficiency should be supplied by vaccines. If our views of the mechanism by which symptoms of infectious disease are produced are correct, namely, that they are due to the reaction of the body to the injurious substance, this objection can have but little weight. Neither is this objection borne out by practical experience in treating generalized infections, for in the majority of instances in which benefit has been claimed the vaccines used have been of the autogenous rather than the stock variety.

The variety of tissue involved by the lesion is a factor to be considered. Histologically the body is covered by a layer of epithelium in every part which comes into contact either directly or indirectly with the open air. This layer, even when diseased, is a potent factor in protection against infection and itself takes a relatively small part in any active inflammation—it either desquamates or remains unchanged. It is poorly supplied with blood, and thus is not readily reached by the antibodies present in the blood stream. The lesson to be drawn from this anatomical fact is that for vaccine therapy to be successful we must have a lesion which involves mesodermal tissue in the strict sense of the word—*i.e.*, the tissue beneath the epithelial covering. This theoretical conclusion is brought out in practice, uncomplicated catarrhal inflammations and superficial skin lesions seldom giving gratifying results from vaccine treatment. An apparent exception to this is in gonorrheal

arthritis in which vaccine therapy is almost universally successful; the pathologic mechanism of this disease is not fully understood, however, and it may be that the periarticular structures and not the synovial membranes are primarily involved.

The circumscription of the lesion is to be considered. Generally speaking the better walled off a focus of infection is, the more readily it will yield to vaccine treatment; antibodies do not penetrate a thick nonvascular pyogenic membrane readily, however, and this may furnish an obstruction to curative results from vaccine therapy.

Another factor is the ability of the bloodvessels in the surrounding tissues to regenerate; frequently old inflammations, particularly those of bone and ulcers opening upon the skin, may fail to heal because the tissues have lost their potentiality for regeneration, and while this cannot be determined beforehand, it should always be considered in estimating the end results.

Not much, then, can be expected from vaccines in a case showing symptoms of generalization, nor in one in which no mesodermal tissues are involved. The ideal case would be one without symptoms of generalization, showing fairly well-circumscribed lesions involving the tissues derived from the mesoderm.

2. *The Selection of the Vaccine.*—Although ordinarily the organism to be used can be easily determined by a culture from the infected area, in certain instances it may from the nature of the case be impossible to secure a culture; no organisms may be grown, or several kinds may be present.

When no culture can be secured and there is no means of judging from the clinical features what the causative organism may be, the selection of a vaccine on a hit-or-miss principle has nothing to recommend it in theory and very little in practice. The treatment of appendicitis, for instance, with colon vaccines can have but little rational basis beyond the fact that colon bacilli have been found associated in a causal relation with appendicitis in certain instances, and some cases have ceased to have active symptoms after inoculation with vaccines; the case in hand may be caused by an entirely different organism. It must not be forgotten, too, that the symptoms of any disease may clear up at times under hygienic and dietetic management, or may have remissions without any treatment at all.

When cultures fail to show a growth by the customary aerobic methods, anaerobic conditions should be tried. While anaerobes will be encountered only in rare instances, they should be given consideration in every case before failure is acknowledged.

When more than one pathogenic organism is present in an infected focus, it is more a matter of good fortune than of scientific accuracy in selecting the causative one, for the usual serological tests, opsonic index, agglutination, lytic test, etc., have not been found satisfactory in this application of serodiagnosis. It seems more logical to use a vaccine made up from one of the organisms present at a time, and to continue this procedure with each of the strains present until a cure has been attained or the method abandoned, than to insult the immune body producing mechanism of an individual with a mixture of all the strains contained in the culture at one time. It may be justifiable when but two strains are present, but the injection of a heterogeneous mixture of four or five varieties in the hope that one of them may be the correct one cannot be said to be conducive to the rapid recovery of the patient. The selection, even in a discriminating manner, of numerous bacteria found to have been at times associated with acute gonorrheal urethritis, acute coryza, arthritis, etc., and their inclusion in a stock vaccine and administered to the patient, can be but little more discerning than a similar procedure with the bacteria from the stool in a case of hemorrhoids or colitis would be.

Autogenous vaccines, if employed in a series of parallel cases, would probably yield a higher percentage of cures than stock vaccines, but because of the expense and time-consuming labor necessary in their

production, it is usually held to be good practice to give a properly selected stock a thorough trial before resorting to the autogenous variety.

Sensitized vaccines have given sufficient promise to warrant further trial; they have not been used in a large enough number of cases to give an accurate idea of their value in relation to the non-sensitized variety.

3. *The Method of Administration.*—Aside from the mere mechanical part of injection, this question resolves itself into one of dosage and intervals between inoculations. This would seem to be a simple problem, but the more a physician uses vaccines the more thought does he give to these matters and the more often is he perplexed concerning them.

The dosage will of course vary with the organism used, and no set rule applicable to all cases can be given. It is a good practice to use the smallest dose recommended for the initial inoculation, and to increase this dose gradually, taking into consideration the local and general reaction of the patient to the vaccine. Marked local or general reaction should lead us to advance the dose with extreme care.

The interval between inoculations should be regulated with as much care as the dosage, and when any doubt exists, no harm will be done by further delay. A fairly good working rule is not to give an injection until the local and general reaction from the preceding one has disappeared.

In the end, questions of dosage and interval cannot follow any set rule, and the individual's own experience in these matters will have to be his guiding light.

Finally, it may be that vaccines act as curative measures not so much on account of an ability to promote healing as because of their influence to prevent reinfection and to limit extension, and the value of active immunization may be altogether prophylactic. In any case, it must not be forgotten that vaccine therapy is only one form of treatment, and other methods, which were used with success before the invention of vaccines, must not be neglected.

CLIMATE IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

MILLS, in the *Medical Record* of May 6, 1916, tells us that his own preference as to climate for the tuberculosis patients is New Mexico and western Texas. Many patients do well in Colorado, but it is too cold for a good many invalids.

New Mexico and western Texas have a maximum of sunshine, the greatest of all germ destroyers, and a minimum of rain. The altitude varies from two to five thousand feet, and that is a desirable factor. The air is dry and, to Mills's notion, has a distinct beneficial effect on the lung invalid. He spent nearly a year in that country for his own health twenty years ago, and he knows whereof he speaks.

The other places that are famous but nearer home he has not so much faith in. The lung invalid, if not too sick, will do better in the country away from tenements and crowded streets and city life generally, no matter where it is. But he does not believe that the true curative air is either in the Adirondacks or in the Carolinas, or in the other places that have a great reputation, except in the places he has mentioned—New Mexico and western Texas. The other places are of benefit because patients sent there are removed from vicious habits or surroundings. When he says vicious, he means physically vicious—unhealthful, not wicked. Sanatoria are numerous, but most of the health-seekers who go to them are benefited by the right living and by the care they receive rather than by the air they breathe.

In New Mexico and western Texas he believes the air itself is of curative value. In any of these places the health-seeker should place himself under the care of a local physician. That is likewise essential. Many lung invalids derive no benefit because they depend on the climate alone and do foolish things. The health-seeker should place himself under competent medical supervision in his new habitat in order that he may know how to get the greatest benefit from his new surroundings.

EDITORIAL.

OPIUM AND PERITONITIS.

Most medical men who graduated from thirty to forty years ago will recall the fact that their teachers in surgery, medicine, and therapeutics were insistent upon the value of opium in the treatment of peritonitis, and this was particularly true in the Philadelphia and New York schools, largely through the influence of Dr. Alonzo Clark, who gave opium for effect and without regard to the number of grains.

With the discovery that peritonitis is always the result of an infection, and usually a localized infection at its beginning, the attention of physicians and surgeons was called to the value of operative interference, and instead of administering opium in peritonitis, with or without operation, the surgeons went to the other extreme and strongly advocated the use of saline cathartics with the idea of depleting the intestinal peritoneum. With the discovery that this method of treatment did no good and that the caput coli in cases of appendicitis was never loaded with feces and therefore did not need a purge, this plan was also pushed aside.

Attention was now directed to the flow of lymph as a means of disseminating infection or of enabling the patient to combat his disease, and simultaneously the method of treating peritonitis by means of the rectal drip was introduced, universally recognized as of value in suitable cases, and now widely resorted to. Indeed, its use has become so popular that this method is probably employed in many cases in which it is not needed, or in which it causes unnecessary discomfort.

The object of this editorial, however, is to deal with an interesting phase of this subject which is well worthy of our attention. We have heard skilful surgeons make the public statement that he who followed the method of giving opium in peritonitis was guilty of malpractice. We have also heard others state, with equal positiveness, that he who did not give saline purges in peritonitis was equally guilty; but, with the whirligig of time, Crile now comes forward with a strong endorsement of opium, stating that the common cause of death in peritonitis, as in any acute infection, is exhaustion, which exhaustion is due to the expenditure of energy in combating the infection; the destructive effects of the resulting acid by-products; the diminished intake of food; and insufficient sleep. He emphasizes the latter factor, since in peritonitis the pain is severe, and in the acute types sleep is rare and fitful. He therefore advocates, for the purpose of diminishing the absorption of poisons and affording drainage, operating under nitrous oxide and local anesthesia combined, placing the patient in the Fowler position and giving physiological rest to the intestine. In order that the latter may be obtained, he advises the free use of opium, and thoroughly endorses Alonzo Clark's original statement that the dose should be measured by its effect upon the respiratory rate and not in grains. Crile also points out that this treatment, if properly pushed until the respirations are markedly slowed, may, by reason of the relaxation of the facial muscles, mislead the physician in thinking that his patient is worse when he is really better. He asserts that laboratory findings have demonstrated that opium protects the brain, the adrenals, and the liver against the damaging effects of toxin, and he publishes a plate showing photomicrographs of these organs exposed to infection with and without opium.

The use of opium also diminishes the need of food in that it diminishes metabolism.

Finally, Crile publishes a plate illustrating, as he thinks, the difference in the appearance of the brain cells with and without sleep after they have been exposed to a toxic agent.

Whether these plates will be universally accepted, as representng the real conditions of important organs, by those who are most competent to study them, we do not know.

The point is that clinicians of forty or fifty years ago, while they may not have been able to explain the results which they achieved by heroic medication, nevertheless were seemingly accurate in the deductions which they made. At times the laboratory investigator, the newly-fledged doctor, and the seeker after novelty are prone to ridicule methods of treatment for which there seems to be no scientific explanation, as determined by laboratory research. This has been so in the case of alcohol, where, as we have pointed out before, the belief that it acted as a stimulant was erroneous, but the observation that it did good in certain cases of disease was correct, and, therefore, laboratory experiments upon healthy men and healthy animals, which seem to indicate that alcohol was always harmful in the course of infectious diseases, while valuable in themselves, in no way prove that the observations of an immense number of clinicians to the contrary are in error.

DOES THE COMBINATION OF QUININE WITH ASPIRIN PRODUCE A TOXIC SUBSTANCE?

Aspirin, like phenacetin, is used in such large quantities by so many of the laity in doses which are even heroic, and is given on the physician's prescription so commonly, that any facts in connection with its action when used alone or in combination with other drugs possess great interest. This is the more true when a drug so commonly employed by the physician and the laity as quinine is found, in some instances, to produce a by-product which is toxic in its nature if it be mixed with aspirin. As quinine is combined with aspirin very frequently in the treatment of influenza, severe colds, and muscular rheumatism, this matter attains a position of first importance.

There does not seem to be any doubt that under certain conditions, which are as yet unexplained, the mixing together of aspirin and quinine results in the production of toxic manifestations. Indeed, it has been claimed that death has resulted from such a combination, and the *Bulletin of Pharmacy* well says that if a mixture of quinine and aspirin was the cause of death it behooves druggists to be cautious in dispensing this combination, certainly on their own initiative.

An important contribution was made to this subject by Scoville before the Detroit Branch of the American Pharmaceutical Association, and published in that Association's Journal for May, 1915, in which it was shown that decomposition of a mixture of quinine sulphate and aspirin sometimes takes place and a poisonous product is formed, to which the term quino-toxin has been applied. Attention has been called to Scoville's paper in The Digest of Comments on the Pharmacopœia.

There are a number of facts in connection with this matter which must be borne in mind before undue alarm is felt concerning it. It would seem probable that the development of such a poison rarely occurs, or, if it commonly occurs, that only a very few human beings are affected by it. Indeed, the proposition would seem to be not unlike that of anaphylaxis after the administration of diphtheria antitoxin. The development of anaphylaxis in human beings is most unfortunate, but it occurs so rarely that while the possibility of its appearance must be borne in mind it has not, and should not, in any way influence the physician in withholding antitoxin in the presence of infection by the microörganism of diphtheria. We note with interest, as we write this note, that a Commission appointed by the Academy of Medicine of Paris reports under date of February 29, 1916, to the effect that grave accidents following the primary injection, or reinjection, of antidiphtheritic serum are very rare, particularly if the injection is made into the subcutaneous tissues, and the fact that such accidents have been recorded should never interfere with recourse to serum therapy.

In all probability several hundred thousand doses of aspirin and quinine combined have been given in the last few years without any serious or harmful results.

The second point of interest is the recol-

lection that certain persons have a distinct idiosyncrasy to quinine and aspirin even when these drugs are used separately. Indeed, it may be truthfully said that quinine is one of the drugs to which a greater number of persons have an idiosyncrasy than any other medicinal substance, unless it be iodide of potash; and salicylic acid and its compounds, which are nearly related in their physiological action to quinine, may be said to occupy the third position as inducers of untoward toxic effects. The symptoms induced by quinine vary all the way from different types of skin rashes to cerebral disturbances. This also holds true in regard to the salicylates.

Under the circumstances it would seem that there is no reason why physicians should give up using quinine and aspirin in combination, but that they should be on the lookout for the development of disagreeable symptoms, and when they feel certain that these symptoms are due to the formation of a new toxic substance rather than to an idiosyncrasy to quinine on the one hand or acetyl salicylic acid on the other, they should report their experience in order that their professional colleagues may gain a correct view of this important matter.

METHODS OF ADMINISTERING ETHER.

Sometimes we are fearful that we deal too frequently in these columns with the subject of surgical anesthesia. If so, we are reflecting only the tendency of all other medical journals, and are following in the footsteps of a multitude of able physicians and surgeons. That an anesthetic satisfactory in every way has not as yet been discovered is well recognized, but it is interesting to note that, although numerous chemical compounds have been tried and advocated during the last thirty years, ether remains, the world over, the anesthetic of choice, except where climatic conditions or the exigencies of war render its use impossible.

We are presented from time to time with various plans, schemes, or modifications of methods by which ether can be administered, varying all the way from the somewhat startling idea that it can be injected intravenously to its injection into the colon when mixed with oil. Some of these methods are at once cast aside. Others find a few enthusiastic supporters, but, as the months or years roll by, it is generally found that the simplest method of administering the anesthetic, the so-called open method, is the best as yet discovered.

Again, various forms of more or less complicated apparatus are brought forward for the administration of ether mixed with oxygen for the determination of the percentage of vapor or atmospheric air, or the combination of ether and nitrous oxide, and for its administration by means of so-called rebreathing technique. Advantages for all these procedures are claimed by some and disapproved by others.

In the *Journal of the American Medical Association* of April 29, 1916, Dr. Isabella C. Herb, a professional anesthetist, discusses the question of ether administration and advocates simplicity in its use. She emphasizes the value of the open method, so that the ether is given very much as chloroform is sometimes used, the covering of the eyes of the patient by wet cotton to protect them, and the giving advice to the patient as to how he, or she, shall breathe. She evidently is an advocate of the simultaneous administration of oxygen, and she is careful to point out that the ether cone should not be placed upon the face until the patient becomes accustomed to the odor and sufficiently under the effect of the drug not to have a sense of strangling or suffocation combined with fear. She also advocates the turning of the head to one side as soon as the patient is sufficiently relaxed to make this possible, as this prevents the tongue from falling back into the pharynx and obstructing respiration.

Concerning the warming of ether vapor before it is given, she comes to the conclusion that there is no distinct advantage in such a procedure.

With the above method of etherization there is no difficulty in maintaining a well-oxygenated state of the patient's blood, be

the operation what it may. By the avoidance of too concentrated a vapor injury to the epithelium of the lung is avoided. And, finally, she insists upon one point not sufficiently recognized, and yet obvious, that the anesthetic state should resemble normal sleep, and that simplicity in the administration of ether, as in all other forms of technique in medicine, is desirable.

THE SOLDIER'S FOOT AND THE TREATMENT OF DISABILITIES.

Of the many contributions to current literature from the war zone few are of greater value, both to the military surgeon and to him whose country is at peace, than those of Jones (*British Medical Journal*, May 30, 1915), whose teaching, based on an enormous experience, is characterized by a sound common sense and a keen appreciation of the methods which promise swift and lasting cure.

He notes that hallux rigidus and hallux valgus are frequently combined with some impairment of the transverse arch which is specially apt to be associated with the painful condition known as metatarsalgia.

Impairments of the longitudinal arch are associated with a train of symptoms found in weak foot, inverted foot, and flat foot. All these types of derangement of the mechanical elements of the foot and the resultant disabilities depend upon strains about the complicated series of joints in the fore part of the foot.

In the hind part of the foot the disabilities are fewer and are mainly connected with painful conditions of the heel, due in the main to such conditions as strain of the insertion of the tendo Achillis, or periostitis of the os calcis, often of traumatic origin.

By the term flatfoot is meant strain of the longitudinal arch. The essential fact in the deformity is abduction and eversion of the fore part of the foot. If it commences as a sudden acute condition it is associated with strain of the inferior calcaneo-scaphoid ligament; to this is due the tenderness elicited on pressure on this ligament just below the tubercle of the scaphoid. This tenderness is characteristic. Pain is often most acute in patients having a high arch and denotes the beginning of the giving way of this arch.

Acute flatfoot may occur in recruits or in nurses returning to duty too soon after illness. Rest and massage are indicated during the acutely painful stage—this for two or three days. There must be no weight-bearing allowed. Thereafter adduction and inversion so as to restore the arch and allow stretched ligaments to shorten. The foot should be molded into correct position and fixed in this by plaster of Paris for ten days to accomplish these ends. Thereafter comes exercise, particularly inversion movements and movements of the toes. The patient is gotten up on shoes roomy for the fore part of the foot, gripping the ankle closely, with a straight inner side and the heels built up one-third of an inch higher on the inner side, tapering gradually to the outer side. The heel should be extended forward on the inner side, and the sole should also be raised one-third of an inch, nor should the patient ever put his foot to the ground without an altered boot or shoe on, otherwise he will unwittingly let his arch descend and so inflict a fresh strain on the ligaments.

Thereafter the man should be instructed to walk with the feet parallel; not with the toes turned out. The walking exercises should be gradually increased. A pronounced case should not be ready for full duty for six weeks, and not then unless his shoes are properly prepared. Recruits with weak feet should be started off with heels raised on the inner side until the muscles get into training. They should also be taught to walk with their feet parallel.

Traumatic flatfoot is an acute condition similar to that just described, excepting it is produced by a sudden force, as for instance the weight of a trap running over a man's foot and straining all the ligaments.

A periarthritis, such as accompanies gonorrhea, for instance, or an ordinary septic infection, characterized by ligaments sod-

den with exudate, allows stretching under even a moderate strain.

If the acute stage of flatfoot be neglected and no effort be made to maintain the foot in an adducted and inverted position, on recovery the ligaments will be in a flat-footed position with stiffness in all the joints. Patients cannot stand on the outer edge of the foot or turn it into an arched shape.

The foot should be wrenched so as to break down all adhesions and make it thoroughly pliable. It is by this means converted into an acute traumatic flatfoot, and should undergo the course of treatment described for that condition.

A flatfoot neglected for many years becomes an "osseous flatfoot"—that is to say, changes occur in the shapes of the bones to adapt them to the erroneous position. These people cannot be made competent soldiers.

Flatfoot due to spasms of the peroneus occurs after puberty and in early adolescence. The patient will have a springless gait, walking with the feet practically rigid and with the toes pointing out. They are both everted, and the inner border over the region of the scaphoid appears thickened and even angular. The character of the walk and the appearance of the feet suggest ossous changes. On being questioned the patient may give a history of injury, such as a fall on the feet; usually he cannot account for it. The pain is often acute, the feet may perspire abnormally, and the patient may not be able to walk more than a short distance. Relief is experienced on removal of the boots. If the patient is asked to invert his foot he cannot do it, and when he attempts to do so the peronei become rigid. The surgeon when he examines the foot manually finds there is pain on pressure over the deltoid ligament, over the scaphoid, and over the tip of the external malleolus, where it impinges upon the os calcis, and tenderness over the peronei along the outer border of the foot. An attempt to invert the ankle causes pain and the peronei strongly resist the effort. The spasm may be overcome by distracting the patient's attention whilst the foot is gently pressed in the direction of inversion, and then at the psychological moment, while the peronei are quiescent, very suddenly inverting the foot and holding it there. This shows osseous changes absent whilst it is held. This condition will not be benefited by mechanical measures. The patient must be anesthetized to relax all spasm, and about three-quarters of an inch of each peroneus should be removed about an inch and a half above the malleolus. The foot must then be fixed for about three weeks, well inverted and adducted at the midtarsal joint, followed by the ordinary treatment for flatfoot.

Subacute flatfoot in the ordinary form is characterized by painlessness after moderate use and pain on unusual function. There is distinct tenderness on pressure below the tuberosity of the scaphoid; there may or may not be pain in other regions. The patient will stand on the outer edge of his foot and can crook his foot into the arched position. This is important, for it means that the patient will recover if the heels of his boots are crooked so as to deviate body weight on to the outer side of the foot.

Exercises and contrast baths—that is, hot and cold water alternately—are useful. If the principle of deviation of body weight on to the outer edge of the foot be intelligently carried out, the usual flatfoot is curable. Even in the bath the patient must be careful to stand on the outer edge of the feet. The whole idea of the treatment is to insure that uninterrupted adaptive shortening of stretched structures shall take place.

A few minutes careless walking in stocking soles will undo all benefit from other treatment by again stretching recovering structures.

Frequently the high arched foot is the most troublesome type when the tendons are strained and the ligaments begin to give. The strain upon the astragalo-scaphoid joint in this type is, for obvious mechanical reasons, great, and the progress of the affection is often marked by a prominence about the scaphoid due to pressure osteitis.

THE LOUSE AS AN ARMY PEST.

The numerous references to the lousiness of the soldiers constituting the armies now arrayed against each other have as a rule implied that this condition is one of discomfort rather than one fraught with any actual menace to health. The irritation caused by the crawling and biting insect can scarcely be conducive to sound sleep or to good temper. Moreover, the intense itching attendant on these bites necessarily leads to a scratch dermatitis.

The subject has been taken up with true scientific acumen by Peacock (*British Medical Journal*, May 27, 1916), lecturer in zoology, University of Durham, who has studied the clothes or body louse, the *Pediculus humanus*, morphologically by first chloroforming the insect, and thereafter fixing it in formalin. Both black and gray were noted; eighteen hundred lice counted yielding 5.4 per cent black.

The casual observer may be led into error; attention is called to the wood-louse, or slater, a crustacean related to the crabs and lobsters, probably an ancestral or originative type of louse, and strongly resembling the latter when at rest. Springtails, which move by leaping, and certain small beetles may be taken for adult lice, and small mites, relatives of the spiders, look like young lice. These mites are very common in food which has been trodden into empty sandbags on the floors of dugouts.

For shelter the louse prefers the quiet, warmth, humidity and comfort of the seams of the clothing, the shirt by preference, though in many cases most eggs were found at the fork of the trousers.

Human blood is the insect's food; the adult may suck for twenty minutes at one time. It is a voracious and wasteful feeder, the excreta often consisting of what appears to be undigested human blood, peristalsis being violent. It feeds as soon as hatched, and pours out saliva which prevents the clotting of the blood.

In copulation the male lies below the female; the penis, being extruded and upcurled, is retained in position by the gonopods of the female. The latter lays five eggs at a sitting and may produce a total of 125.

If taken away from the body for two days the louse becomes moribund. The maximum time during which eggs may remain dormant has been found by Warburtion to be about forty days. Hence it follows that eggs on garments not treated by ironing and disinfection are possible sources of infestation for as long as a month after laying; and the removal of the clothing from the body for a few days in order to kill the eggs and lice by exposure is not a practicable scheme.

It is true that the louse is a parasite which is utterly dependent upon man's blood for sustenance, and man's body and clothing for prolonged, prosperous longevity and reproduction.

The ingenious author charted the peregrinations of four lice, which showed they were astonishing but aimless wanderers. On a shirt in the condition termed "walking" were computed 10,000 living lice. Though lice may leave the body of a host or go to one who sleeps on infected bedding, a deliberate effort to reach a human body or recently discarded and sweat-impregnated clothing was not observed in the captive insect. The instinct of pursuing the host seems to be a feeble one.

Peacock established standards of lousiness and publishes graphs illustrating the degree of infestation. Ninety-five per cent of the men examined were infested, while five per cent were what are called maximum cases.

It might be expected that soldiers living in the bare trenches, where no dugouts exist, would be more free from lice than those living in dugouts. This was not found to be the case. There was a general impression that the dugouts were swarming with lice. A careful examination of these dugouts failed to discover a single living louse. It is, therefore, obvious that the dugouts play a minor part in the harboring and disseminating of the parasite. It is also true that blankets are of minor im-

portance as harborers and centers of dissemination.

As to how the parasite first gained a foothold in the army at the front, they were probably carried by the recruits coming from verminous slums, mingling with their fellows under circumstances which did not allow of frequent cleansing. The conditions for rapid propagation were favorable and taken advantage of by the insect.

As to the study of the methods of prevention and of destruction of the insect, the insecticides are classed according to the killing efficiency as measured by the sum of the percentage of insects destroyed in a certain time. The general efficiency is measured by the sum of the percentage of insects killed, evacuated, and unaccounted for in a certain time, and as to the deterrent efficiency this is measured by the percentage of insects which the insecticide deters from reaching the body.

Of the various agents tested the N. C. I. (naphthalene 96 per cent, creosote 2 per cent, iodoform 2 per cent) is the best all-around germicide used. The author in his scientific enthusiasm placed 700 vigorous lice in a sleeping-bag improvised from a blanket, and used the N. C. I. preparation on his shirt back and front, on his riding breeches at the fork and as far down as the knees. Socks instead of puttees were worn, the shirt neck was opened, and the sleeves rolled up as far as the elbows. Almost immediately after settling in the sleeping-bag lice were felt crawling in great numbers in the socks, on the arms, and a few at the neck—that is, those parts of the clothing and body not treated with the powder. Next morning 155 dead lice were shaken from the socks, 30 dead lice were found below the breeches' knees; one was found at the thigh; no lice were found on the shirt. The powder was a complete deterrent.

Vermijelli was also found to be highly effective, the body being anointed from neck to knees. Local applications seemed only to cause the lice to migrate to those parts of the body not treated. A still more powerful ointment was made by melting two pounds of soft paraffin with two ounces of crude tar oil. The N. C. I. and vermijelli, the latter being smeared at the fork of the trousers and the seams, the N. C. I. being dusted down the shirt and trousers, were entirely efficient, the efficiency lasting from three to seven days. Mercury ointment, white mercury powder, and sulphur were not efficient.

The author suggests a research center and the formation of classes for the study of the louse, his habits and his weaknesses; also the issuing of a short and very sensible leaflet on the use of divisional baths, the sterilization of all clothing by heat and steam under pressure, and the vigorous following up on the part of proficient men in a definite campaign against the pest.

Bacot, entomologist to the Lister Institute of Preventive Medicine, studied both the body and head lice, which he kept in small entomological glass-bottomed boxes, the lids being removed and fine silk gauze stretched across the open ends in their place. The insects fed readily through the gauze when this was placed against the skin. These boxes containing the lice were carried in waistcoat pockets. The insects had approximately from six to seven hours daily during which they could feed. It was noticed that when opportunities for feeding through the day were afforded the egg production was increased. Interesting experiments were carried on in cross-breeding which seemed to be entirely successful. He noticed that pairing took place at any hour, and a male of the body louse fertilized 18 out of 20 females placed in succession. The head louse seemed less fertile, although on four trials ten females were fertilized, and he might possibly have equaled the record of the body louse but for the scarcity of virgin females while the experiment was in progress. The body louse retained the power of laying fertile eggs for twenty days after removal of the male, and in one instance laid 295 eggs. The highest record for a head louse was 141. The average life of the louse is about a month, for hybrids about the same, and the latter reproduce as freely as the pure bred.

Two days' freezing temperature was not lethal to active specimens. Estimating the egg period as twelve days, and a further twelve days to the maturity of the females, allowing an average of eight eggs per day, spread over a fertility period of forty days, we find that during her life a single female may have 4160 offspring.

Half an hour's exposure to a temperature of 55° killed both active lice and their eggs.

Dalmatian insect powder in the fresh condition has a definite insecticidal action, killing all lice immersed in it in a period of two hours. Exposed to air, however, the powder quickly loses its value. It seems conclusively shown that commercial naphthalene is more efficient than freshly powdered pure naphthalene, and that the lethal power of this drug is dependent upon the presence of hydrocarbons and coal-tar derivatives other than pure naphthalene.

It would seem from army experience that lice are rarely acquired from bedding; that once acquired the body louse can be gotten rid of only by thorough disinfection of the clothing; that this is best accomplished by heat, the sufferers in the meantime bathing; that if heat be impracticable commercial naphthalene is an efficient insecticide.

SOME SURGICAL LESSONS OF THE WAR.

The readers of the THERAPEUTIC GAZETTE will doubtless have noted that considerable space has been given to the consideration of the treatment of the wounded in the present war as evidenced by current literature in the form of reports of those surgeons who have been to the front. Hypertonic solution, bags of sodium chloride, Dakin's solution, the use of electric lights, all have their enthusiastic advocates, but none have received that general acceptance which betokens efficiency. Therefore, a visitor to a dozen hospitals on any battle front will find that, insofar as antiseptics are concerned, half a dozen different ones are used, and perhaps in a considerable number of these hospitals a total rejection of all antiseptics, hypertonic solutions, and everything but normal salt solution. There is a general consensus of opinion, as carried both by word of mouth and in written communication, to the effect that the most efficient treatment of badly infected wounds is by the continuous bath, and there is a universal belief in the efficiency of thorough and complete drainage and the desirability of local cleanliness. There is a growing belief in the value of pain or its absence as an index of the injurious or beneficial dressing. There exists also a well-founded concept of the danger of drainage tubes across blood-vessels. There seems to be a general feeling that the chlorinated solutions tend to encourage secondary hemorrhage. A slight tendency is noted toward an elective choice of antiseptics in accordance with the particular form of infection. The fact is well established and generally recognized that plastics on the healed cases of virulent infection do badly, and that a clean wound is essential to the success of a plastic. There is a growing tendency toward prompt intervention in penetrating wounds of the chest and belly, but the fact remains that the best results are incident, not to a particular antiseptic or treatment, but to the judgment, experience, and sound common sense of the surgeon applying the broad general principles of relief of tension and free drainage.

REPORTS ON THERAPEUTIC PROGRESS.

PERFORATION IN TYPHOID FEVER.

The *Official Bulletin of the Chicago Medical Society* of May 13, 1916, reports a summary of a paper by EDDY in which, after a thorough review of the literature, he discussed the differential diagnosis and treatment of typhoid perforation.

With reference to the treatment, he said that there is only one method in these cases requiring discussion, which was well stated by Mikulicz in 1884 when he said: "If suspicious of perforation, one should not wait for an exact diagnosis and for peritonitis to reach a profound degree, but, on the contrary, one should immediately proceed to an exploratory operation, which in any case is free from danger." How much more true the above statement is in present-day surgery is well understood. Our patient's life depends on the recognition of the perforation, and not the resulting peritonitis, and unless we are capable of doing this we are a stumbling-block to the patient's welfare.

As soon as perforation is recognized, or greatly suspected, the patient should be given morphine immediately. Quoting Morris: "We are choosing the lesser of two evils, for the tremendous shock is more deadly than are the escaping bacteria when not quieted by opium."

There seems to be a difference of opinion as to the choice of anesthesia. Woolsey believes that these cases take gas and ether well. In two cases reported by him, cocaine was used satisfactorily for exploration, but retraction of the edges and the necessary handling of the inflamed bowel were painful, and this, together with the realization of being subjected to an operation, causes more shock than general anesthesia.

As to choice of incision, most surgeons will agree on the right rectus, or McBurney's, as statistics conclusively show that over 80 per cent of the cases perforate in the lower eighteen inches of the ileum, and the nearer we are to the lateral wall the less the danger of spreading the infection over the peritoneal cavity. The perforation should be located as quickly as possible and with little handling of the bowel.

The perforation can be closed in most cases with a purse-string reënforced with a row of Lembert or mattress sutures; the greatest care being taken, however, not to constrict the lumen of the bowel, which, if done, will almost certainly result in ileus. In all cases the ileum should be explored as far as the inflammatory process extends for multiple perforations or deep ulcers. Some cases may require resection where the perforation is large, but unfortunately the quickly resulting peritonitis and extreme shock of such an extensive procedure have proven fatal in nearly all cases of this character reported in the literature.

The peritoneal cavity should be carefully sponged with saline solution, but avoid irrigation unless a general peritonitis exists. Thorough drainage should be employed and the Fowler position obtained as soon as the patient's condition will permit.

Intravenous or subcutaneous injection, or proctoclysis, should be used according to the demands of the patient's condition. Morphine should be continued until the peritonitis becomes well localized and the bowel not disturbed in any way. Later they should be taken care of by flushing and small doses of eserine. No food whatever should be given by mouth, and if vomiting has been quite severe, lavage should be used before the patient comes from under the anesthetic. Stimulation should be used according to the demands of the patient, and the condition of the heart muscle carefully observed.

In conclusion, the following deductions may be drawn: (1) While perforation varies greatly in different epidemics, about 12 per cent of the total death-rate is due to this complication. (2) That perforation occurs in about 3 per cent of all cases treated. (3) That perforation is relatively infrequent in children. (4) Statistics show that over 80 per cent of total perforations occur in the lower part of the ileum. (5) That this location of perforation coincides with the study of Baer. (6) That the majority of cases perforate during the second and

third week. (7) Diarrhea is an important factor in its production. (8) Acute abdominal pain during the course of typhoid should always be taken seriously. (9) The sudden rise of blood-pressure is positive evidence of perforation, while an unchanged pressure is not of negative value. (10) The importance of a careful study of the blood cannot be overestimated. (11) The welfare of the patient depends on our ability to differentiate between the symptoms of perforation and those of the resulting peritonitis. (12) The treatment of perforation is surgical, and the death-rate is in inverse ratio to the length of time allowed to elapse before operation. (13) Opiates are indicated as soon as perforation has taken place, and should be continued until the peritonitis has become well localized.

THE RELIEF OF CHRONIC OBSTRUCTIVE JAUNDICE BY PALLIATIVE OPERATION.

In the *Official Bulletin of the Chicago Medical Society* of May 13, 1916, ERDMANN states that the object of his paper is to review the literature pertaining to obstructive jaundice and to offer suggestions for the operative relief of chronic cholemia; that the paper considers only those cases of biliary and pancreatic obstruction which are incident to malignant disease or nonremovable tumors about the terminal portion of the common and pancreatic ducts.

The clinical picture of chronic obstructive jaundice is well known. The relief of biliary stasis must be provided by a drainage operation between some portions of the biliary apparatus and the gastrointestinal tract. The indications for operation in malignant obstruction to the biliary flow may be summarized as, first, mistaken diagnosis; secondly, the relief of distention pain; thirdly, intractable pruritus; fourthly, social; fifthly, surgical euthanasia.

A neoplasm at the ampulla of Vater will bring about not only biliary obstruction, but a variable degree of pancreatic obstruction. Cholecystenterostomy will deliver the biliary secretion or excretion into the intestinal tract, but would only rarely affect the pancreatic secretion. In spite of the elimination of jaundice and the biliary stasis by cholecystenterostomy, many of these cases may result in more or less rapid death as the result of pancreatic insufficiency.

Any chronic obstructive condition of the duodenum at or below the ampulla of Vater will introduce additionally the signs of pyloric stenosis. In obstructive conditions at the ampulla of Vater it is usual to find the gall-bladder distended with bile. This is not necessarily always the case, as a distinct hydrops and a well-dilated common duct filled with mucoid fluid have been observed.

The most frequent obstructive condition is from carcinoma of the pancreas, ampulla, or duodenum. Seventy per cent of cancers of the duodenum are carcinomata of the ampulla of Vater. Pancreatic cancer is the most rapidly fatal of any form of carcinoma. Up to August, 1915, 22 cases of excision of growths at the ampulla have been reported, and the results are not encouraging. Under most circumstances operative intervention will be in the nature of a palliative proceeding to provide drainage for the biliary secretion. For an obstructive condition of the common duct or its terminus we have a choice of operation, of which an anastomosis between the gall-bladder and some nearly approximate portion of the gut tube is physiologically and anatomically correct. The choice of a particular operation will depend upon a number of factors—one, the physiological efficiency of the procedure; two, the ease of technical accomplishment; three, the relative immunity from ascending infection; and four, the immediate and remote effect upon the metabolism of the patient The classical operation of cholecystduodenostomy simulates the natural conditions of biliary drainage better than other types, but its mortality is higher than cholecystogastrostomy. The biliary portion found most convenient is the gall-bladder. The best results are obtained from cholecystogastrosomy. There is no objection to the presence of bile in the stomach. Cholecystenteros-

tomy carries with it possibilities of angulation. On theoretical grounds the union between the colon and gall-bladder is to be deprecated, and on other grounds as well. However, in spite of certain manifest defects, in a certain series the early cholecystocolostomies have a longer period of postoperative longevity than any of the other early cases.

In a few cases of operation on pancreatic disease it has been observed that the patient reacts well up to thirty-six hours after operation; then ensues a rapid fall in blood-pressure, cold, clammy perspiration, and diminished urine, showing acetone and diacetic acid. By means of continuous proctoclysis and saline infusion, urinary elimination is increased and the patient improves. In some of the deaths that occur after operation the element of acidosis is present.

The essayist reported a case of carcinoma of the duodenum and papilla of Vater; cholecystostomy and posterior gastroenterostomy; secondary operation, cholecystojejunostomy, with recovery. Also a case of carcinoma of the duodenum with biliary obstruction; transfusion; posterior gastroenterostomy and cholecystogastrostomy, with recovery.

A case of carcinoma of the common duct, cholecystogastrostomy, with death. A case of carcinoma of the pancreas, hepaticoduodenostomy, with death. Carcinoma of pancreas, cholecystocolostomy, with recovery.

Carcinoma of pancreas and ampulla of Vater; posterior gastroenterostomy; cholecystostomy, with recovery. Secondary cholecystocolostomy, death.

Carcinoma of pancreas, hydrops of gall-bladder; cholecystostomy; choledochostomy, death.

Conclusions: (1) All cases of obstructive jaundice are entitled to operative consideration. There is a certain definite percentage of cases that are cured because there has been a mistake in the diagnosis. (2) Any of the above operations are not prohibitive, considering the severity of the disease and its hopeless outlook. (3) The immediate relief from itching, in addition to the prolongation of life, is an exceptionally strong argument for operation. (4) Operation obviates the development of "pressure pain" from increasing distention of the biliary apparatus. (5) These operations are advised solely as palliative procedures, and as such their purpose must be clearly understood.

THE OCULAR CAUSES OF HEADACHE.

In the *Albany Medical Annals* for May, 1916, BEDELL reaches these conclusions:

1. Ocular headaches may be the result of a refractive muscle error or local inflammation.

2. Ocular headache, although most common in the afternoon, may be at any time of day or night.

3. The headache of middle life demands careful ocular examination.

4. Ocular headache may be present even with perfect distant and near vision.

5. In no case is the eye excluded until a cycloplegic has been used.

6. Occipital pain and nape of the neck discomfort extending even to the shoulders is often of ocular origin.

7. When proper, correct lenses are ordered, they must be worn as directed and must be accurately placed before the patient's eyes.

THE DIABETIC QUESTION.

In the *Journal of the American Medical Association* of May 13, 1916, ALLEN, whose methods of treatment of diabetes we have already called attention to more than once, tells us that in the practical therapy of acidosis it is still a wise general rule to use alkalies and other customary measures at the outset, though under proper conditions and with adequate tests of the acidosis nearly all cases can be managed without alkalies. If alkalies are used the dosage can be smaller than formerly employed for threatened coma, and the injurious or dangerous effects of the large doses may thus be avoided. For the average patient, a proper fasting and dietary régime quickly

obviates the need for alkalies. For the occasional patient who reacts badly to fasting, the practice of Allen is not to resort to excessive doses of bicarbonate, but to terminate the fast by giving restricted diet. After a week or two of such diet a second fast has regularly proved successful. In no case is an alkali given for more than a very short period, and the ideal in all cases is to prevent the formation of the acid substances rather than to attempt to neutralize or eliminate them by means of sodium bicarbonate.

Leaving this digression concerning acidosis, let us return to our original question, What is diabetes? If it springs from deficiency of the internal secretion of the pancreas, what are the results or manifestations of this deficiency? The most obvious fault is in the sugar metabolism; here the distinctive feature of diabetes is not glucose in the urine, but diminished power to use glucose. But diabetes is probably something broader than this. The normal person eats food, digests it, and absorbs it into his blood, and his cells assimilate it for their nutrition. The diabetic eats, digests, and absorbs normally, but does not assimilate normally. Diabetes may probably be defined as a specific deficiency of the power of assimilating food.

The question may be pushed further: What is the mechanism of this power, the reason for this deficiency? Concerning this Allen has previously proposed a tentative hypothesis of "binding substances." The hypothesis is merely suggestive. It is entirely without chemical support. But since chemical methods have not yet been able to grasp the problem of the mechanism of diabetes, the negative chemical evidence is not decisive. In addition to the previous observations concerning the diuretic action of sugar, the following may possibly have some connection with this idea of the ability of cells to bind food substances. First, the accumulation of reserves, as when the body gains weight, diminishes tolerance and aggravates diabetes; whereas the reducing of the reserve stores, by low diet or by exercise, increases tolerance and checks diabetes. Second, any kind of food—except apparently alcohol, which has no storage form—weakens the assimilative power for other foods. Adding carbohydrate to a diabetic diet may give rise to ketonuria. Adding fat to a diabetic diet may give rise to glycosuria. This fact was partially obscured when it was the practice to give diabetics carbohydrate for the sake of relieving acidosis. Certainly an excess of carbohydrate, by forcing combustion of carbohydrate and also diminishing combustion of fat, may temporarily diminish ketonuria; but the injury to the patient's actual functional capacity is still evident. After a sufficient period of carbohydrate excess, there is greater ketonuria than before on the same diet as before; and it is difficult to maintain that ketonuria is due merely to lack of carbohydrate. The true conditions are more clearly observable under the fasting treatment.

The history of diabetic therapy, so far as it is significant or valuable, consists merely in an interweaving or alternation of two principles. One is restriction of the sugar-yielding elements of the diet, namely, carbohydrate and protein. The other is diminution of the total caloric value of the diet. The latter is the older. Willis reported benefit from a diet limited to milk and barley-water cooked with bread. There have been milk and vegetable cures since then; but whereas the authors aimed at a non-toxic diet, what they really achieved was undernutrition. Then came Rollo with his notion of animal food to strengthen digestion, and thus the benefit of carbohydrate restriction was accidentally discovered. The harmfulness of excessvie protein-fat diet was soon recognized, and Bouchardst, Cantani, and Naunyn introduced fast-days and lower diet. Then came the ritual of von Noorden's oat cure, and the widespread ideas concerning special properties in oatmeal, which ought not to have gained credence among those acquainted with the literature of previous carbohydrate and vegetable diets. Blum broke the spell by having the courage to declare that oatmeal is like any other form of starch; and then

straightway others made the test, and it became established that there is no special virtue of any kind in oatmeal. The oat cure gave patients a few days' rest from protein-fat excess by substituting carbohydrate excess. Its advocates claimed that it avoided the undernutrition characteristic of other carbohydrate cures, by making up a diet adequate in protein and calories on the oat days; but the undernutrition was present in the fast-days or vegetable days preceding and following the "cure," and therein lay the principal benefit. The oat cure merely shows that a large proportion of diabetics still manifest a surprisingly high carbohydrate tolerance when conditions are not too unfavorable. It is a failure in genuinely severe cases.

The fasting treatment has been previously outlined, and details will be published later. It remains true that diabetics with the severest type of the disease have been permanently freed from glycosuria and ketonuria. There have been deaths from complications and accidents before treatment could be completed, and physicians will be able to judge concerning these when the details are published. No complication has appeared in any case after treatment unless the one death from tuberculosis be classified here. Five patients broke their diet and are dead. In the others, who have followed the diet, no inherent downward tendency has yet been observed, and progressive improvement seems to be evident in the majority. The longest observation is now only twenty-one months, so the ultimate results are still subject to question. It would not be strange to find that some severe diabetics have too little assimilative function left to maintain life, but thus far it has been possible to avoid such a confession. To some extent the tolerance, but especially the general well-being, of the patients has been improvd by the introduction of vigorous exercise, and most of those treated are now earning their living. It is hoped that a real reduction of the mortality of diabetes will be possible; but if ultimate results disappoint this hope, the treatment is justified by the benefit to the comfort and usefulness of the patients. It is in harmony with the observed benefits of carbohydrate restriction and undernutrition in the past history of diabetes, and it makes an efficient application to diabetes of one of the best established principles of all therapeutics, namely, rest of a weakened function. What is further desirable is obviously some positive means of strengthening the weakened function; but no such method has yet been discovered for diabetes.

THE TREATMENT OF PYORRHEA ALVEOLARIS AND ITS SECONDARY SYSTEMIC INFECTIONS BY DEEP MUSCULAR INJECTIONS OF MERCURY.

WRIGHT in the *Medical Record* of May 6, 1916, points out in discussing this subject that besides the bacterial infection there is a second factor that requires every consideration, viz., that in a very large majority of cases calcareous deposits occur to a greater or less degree along the roots and necks of the teeth, which, acting as foreign bodies, are a constant source of irritation. It is therefore obvious that in order to cure this disease in a large majority of cases two courses of treatment must be pursued at the same time: (1) The infecting organism or organisms must be attacked by the use of some parasitotropic agent, and (2) during the administration of this agent surgical interference must be resorted to locally, all calcareous deposits and tartar wherever found being removed, and the toilet of the oral cavity made as perfect as possible.

The multiplicity of the organisms productive of this infection makes it necessary to select for systemic administration an agent parasitotropic to them all. That mercury in proper doses and properly administered has this qualification when the vegetable parasites are in question, Wright has repeatedly demonstrated.

If it is found that the entameba buccalis is the primary causative factor of pyorrhea, Wright's results and the observations of Price and Riethmüller would show conclu-

sively that mercury is also parasitotropic for this particular protozoan at least.

In this disease, in the male patient, a deep muscular injection of mercuric succinimide, 1 grain (65 mgm.), should be administered every seventh day, until the discharge of pus has entirely disappeared, and the gums have regained their normal condition and appearance. In female patients the dose should be from 1/5 grain (13 mgm.) to 2/5 grain (26 mgm.) less than that administered to males. Mercurialism of any marked degree should be met with smaller doses at succeeding injections, or, if the symptoms are severe, the mercury is discontinued until they have disappeared.

The syringe used is all glass, and holding forty minims. The needles used are No. 26, intramuscular, for the above syringe.

Syringe and needle are sterilized before using. The solutions are so made that 1/5 grain of mercuric succinimide is dissolved in four minims of hot, sterile distilled water.

The site of injection is the buttock, using alternating sides for succeeding injections. The skin is sterilized with tincture of iodine. The method of inserting the needle is as follows: The needle butt is held between the thumb and third finger with the index-finger over the butt, the shaft of the needle to be perpendicular to the skin surface, the point about three inches distant from it. With a quick, forceful, downward thrust the needle is driven deeply into the substance of the gluteal muscles, from point to butt. Then into the syringe as many minims of the sterile mercuric solution as represent the desired dose are drawn; if it is to be 1 grain, 20 minims will be required. Then the syringe tip is inserted into the socket of the needle, and the injection is made slowly. The needle is withdrawn, and tincture of iodine is applied to the point of injection. The injections are to be repeated every seventh day.

The local treatment as administered by Dr. P. G. White embraces the following steps: Careful expulsion of the pus from the pockets; thorough removal of calcareous deposits and tartar wherever found; extraction of hopeless teeth and roots; polishing of the tooth structure, followed by applying to the margin of the gums equal parts of tincture of iodine, tincture of aconite, and chloroform, continued every other day. This latter procedure may be and has been omitted in many of Wright's cases without any appreciable difference in the time required to effect a cure, but Wright considers it a valuable adjunct to the local curettage and systemic treatment.

The longest period of time required to effect a cure was forty-one days, the shortest four days; average seventeen days. The greatest number of injections required to cure the primary infection in any one case was seven, the smallest number one; average 2.9. The diagnosis in each case was based upon classical symptoms and conditions; pus was present in every case, the presence of slight pathological changes in the gum tissues, or of any particular organism, not being considered as diagnostic.

THE TREATMENT OF CARDIAC SYPHILIS.

In the *New York Medical Journal* of May 6, 1916, ANDERS tells us that the majority of the cases of cardiac syphilis which he has treated either in hospital or private practice have been late cases, typical instances for the most part of aortic regurgitation in decompensation, and equally typical ones of myocardial degeneration independent of aortic incompetence. In the management of these cases, in many of which dropsy has supervened, the usual circulatory indications are to be met, as under other circumstances. For example, complete rest of body, hygienic and therapeutic measures, such as digitalis and other cardiants, are all to be enjoined, with modifications to suit individual cases. It cannot, however, be denied that these agencies fail to afford as satisfactory results as in non-syphilitic cases of cardiac disease.

Assuming the Wassermann reaction to be present, how shall the syphilitic element be attacked in these late cases? Shall sal-

varsan be employed in aortic incompetence after decompensation has appeared? There are two small classes of cases in which the use of salvarsan is, to the writer's mind, quite justifiable: (1) In myocarditis and aortic insufficiency in which the actual condition of the myocardium is indeterminable, but obviously not degenerated to a marked extent; and (2) cases occurring in patients who urgently demand that something be done to afford relief from their sufferings. Stone has invited attention to two cases belonging to the latter class in which the distressing symptoms were minimized by the use of salvarsan.

In well-marked cases of syphilitic myocarditis and aortic incompetency due to the same cause, it is the writer's custom to give mercury a prolonged trial by inunction, and this failing, by the hypodermic method. If this does not yield a favorable result—*i.e.*, a negative Wassermann reaction—then salvarsan is used intramuscularly, at first, however, in small doses. In this group of cases the injections of salvarsan are to be followed by a period of absolute physical rest. Ehrlich, quoted by Held, emphasizes this point, stating that it is an important factor in the treatment with salvarsan of cardiovascular conditions dependent on syphilis. All such cases should be treated in a hospital, and Held properly recommends that the patient be kept at rest for from twenty-four to thirty-six hours—in instances of myocardial degeneration not less than two weeks—and subjected to all other measures entering into the routine treatment of this condition.

Anders agrees with Daland that the intravenous method of administration of this agent is too hazardous to life to permit of its adoption in these cases; especially is this true where a decided and rapid invasion of the myocardium has declared itself symptomatically, *e.g.*, in arrhythmia, in tachycardia, and in the event of the development of fresh murmurs. It should be pointed out that experience has shown neosalvarsan to be no less apt to induce serious collapse than salvarsan, and the former, in the writer's experience, is not less painful than the latter. Brooks and Carroll are of the opinion that the old salvarsan is more efficacious in the relief of heart complications in syphilis than neosalvarsan.

Unless a negative Wassermann reaction occurs when salvarsan is administered in the manner stated above, a follow-up course of mercury should be accorded a fair trial, and it may now give a permanent result. To show the degree of improvement gained from any method of treatment, the Wassermann test should be, as already stated, undertaken from time to time.

The iodides are indicated in the treatment of cardiac syphilis after the active process has been checked or has ceased, in order to effect absorption and replacement of tissue, and it is advisable to continue them so long as progressive improvement is manifest. For a period of one year after a negative Wassermann reaction has been obtained, mercury should also be exhibited, and this combined medication should not be neglected. The dose of the iodides, preferably of potassium, may be pushed to the limit of tolerance, if desired, but Anders has not seen any better results from this mode of administration than from a maximum dose of ten or fifteen grains gradually reached after commencing with a five-grain dose.

OBSERVATIONS IN PHYLACOGEN THERAPY BY A GENERAL PRACTITIONER.

The *Louisville Monthly Journal of Medicine and Surgery* for May, 1916, contains an article by GODFREY in which he states that his experience in the use of the phylacogens has extended over a period of three years. From the results he has had during this time it is his conviction that, when a diagnosis is properly made by aid of the modern laboratory and clinical methods, and the appropriate phylacogen used intravenously with good technique and in small doses frequently repeated, it is certainly the preparation *par excellence* in the treatment of infections, particularly of the rheumatic and of the metastatic gonorrheal types.

THE INTRAVENOUS ADMINISTRATION OF MERCURY IN SYPHILIS.

In the *Medical Record* of May 6, 1916, SHAW states that the use of the bichloride of mercury as an efficient form of anti-syphilitic medication was suggested to him by Dr. Shropshire, who gave Shaw a reprint of an article by an Alabama physician. And as the availability of salvarsan was fast decreasing, and as such had always been too costly so far as certain classes of patients were concerned, especially the Mexican who applies at the free clinics, and for routine use in the municipal out-patient departments, they decided to begin the use of mercury salts intravenously; they entered upon this work at the City Hospital with the idea of determining a definite average dose and time of administration, in all of which work they have been ably assisted by Dr. Barrow, who has undertaken the active administration of the medicine.

They first used the bichloride of mercury in physiological salt solution in doses of 1/12 to 1/8 grain of the bichloride in 10 to 20 Cc. of the salt solution. They found, however, that unless this solution was prepared freshly immediately before the administration, the patient presented very alarming symptoms from one to six hours after receiving the medicine, such as chill, temperature 102° to 104° F., pain in the abdomen, bloody stools, retention of urine, albuminuria in some cases, nausea and vomiting, together with headache. This reaction was due to the breaking up of the bichloride into calomel and HCl, and not to contamination by live or dead bacteria or by bacterial products. All references consulted, however, insisted upon the use of sodium chloride in the intravenous solution to prevent the laking of the blood. Upon consulting his notes from the Oppenheim clinic in Vienna, Shaw found the following method used:

Bichloride of mercury, 0.20;
Sodium chloride, 0.30;
Distilled water, 100.00.

Give daily 1 Cc. intravenously.

The effects were quick. The patient got practically 1/30 grain bichloride per day. Shaw does not remember having seen any bad effects, local or constitutional.

He concludes that:

1. The intravenous usage of the bichloride of mercury is quick, safe, and certain; the dosage is mathematically exact and the administration is free from pain.

2. The immediate introduction of the curative agent into the circulating blood is what has not been obtained by the other methods of using mercury.

3. The phlebitis and the periphlebitis occur in proportion to the concentration of the solution used, and this danger can be minimized still further whenever the sensitiveness of the patient demands.

4. The effects are just as quick, in many cases surer and more permanent than those following neosalvarsan or the salvarsan, and the drug acts in cases in which these have given no appreciable results.

5. Bichloride intravenously is the poor man's remedy, and because of its cheapness, availability, and ease of administration, Shaw wonders why its use was ever discontinued after once it was thoroughly tried.

THE PROPHYLACTIC USE OF TETANUS ANTITOXIN.

In the *American Journal of the Medical Sciences* for May, 1916, ROBERTSON concludes an article as follows:

1. The most ideal and perfect protection against tetanus is the protection of active immunity produced before the infection has occurred. This admittedly is not yet practical, but deserves further consideration and research.

2. In the large majority of cases the subcutaneous injection of twenty units immediately after the injury will prevent with certainty the occurrence of tetanus. The delay of a few hours in making the injection may mean the loss of life.

3. Local applications of fluid antitoxin on the wound are efficacious, but unnecessarily wasteful and not always practical.

4. In cases in which injections cannot readily be made, especially in time of war, the immediate application to the wound of

dried antitoxin tampons moistened by clean fluid may be used as a temporary substitute until fluid antitoxin can be injected.

5. Powdered antitoxin on the wound is not, as a rule, dependable. Its one useful field is perhaps the prevention of tetanus neonatorum.

6. Certain failures are to be expected in the prophylactic treatment of tetanus as carried out at the present time. Occasionally cases of tetanus will develop in spite of the most careful precautions.

7. The protection afforded by antitoxin lasts from two to three weeks. Hence in cases of protracted suppuration, or where for other reasons secondary surgical interference is contemplated, either second injections of antitoxin should be made or dry antitoxin tampons freshly moistened should be placed on the wound.

8. Certain complications, most frequently urticaria-like eruptions, and very rarely more serious results, may follow injections of antitoxin.

THE INTRACRANIAL INJECTION OF SALVARSANIZED SERUM.

WARDNER in the *American Journal of Insanity* for April, 1916, writing of his experiences with this heroic method says of the fourteen cases, five improved sufficiently to be able to go back to their work, and to date have remained well for from seven to eleven months. At the end of eleven months one of these cases had a bad relapse. He was immediately brought back to the hospital, and (Wardner thinks this a point much in favor of the efficacy of the treatment) he responded immediately to additional applications of the serum. At present he is well, mentally and physically, and has parole of the grounds. Three other well-developed cases have improved sufficiently to be put upon parole of the grounds and are doing efficient work about the hospital. Three others have shown fairly marked physical and mental improvement, but cannot as yet be trusted at large. Two have died. In both of these cases autopsies were performed, and both showed, grossly and microscopically, changes suggestive of general paresis. The immediate cause of death was in one case bronchopneumonia, and in the other, which had right-sided convulsions at intervals, there was found a large cyst underlying the left motor cortex. This last case had previously shown a well-marked improvement and at the time of death was on parole. Two cases have shown no improvement.

Both mental and physical improvement has generally been observed after the second or third operation, and has followed so closely upon the treatment as to practically preclude the idea of coincidence. The maximum amount of improvement has occurred as a rule after six or seven treatments.

That the operation is not dangerous is shown by the fact that 102 have been performed without untoward results in any case. Thirty minutes suffices for the whole procedure, and the anesthetic has been well borne in all Wardner's cases.

The cases treated were not selected but were taken at random from the admissions of the past two years. Every attempt has been made to exclude psychoses other than general paresis, and in every case the clinical diagnoses have been supported by the laboratory findings.

Where pupilary disturbances existed no marked change has been noted after treatment. Reflexes, when previously exaggerated, show a tendency to become less so. Coördination and speech have been improved in all.

In the blood the Wassermann reaction has been rendered negative in six, reduced in intensity in four, unchanged in three, and not taken in one. In the spinal fluid the Wassermann has been rendered negative in two, reduced in six, not retaken in two, unchanged in the rest. The cell count has been reduced to below 10 per cm. in 12; not retaken in two. The Ross-Jones reaction for globulin has been made negative in one; unchanged in the remainder.

What the final outcome of these cases will be Wardner cannot, of course, state. His best results have occurred in those in

which the manifestation of the disease process had been noticed within a comparatively short time, and in which the actual destruction of brain tissue might reasonably be supposed to be slight. He believes that if cases of general paresis could be diagnosed early and thoroughly treated much might be done to control the future progress of the condition.

CITRATE TRANSFUSION FOR HEMORRHAGE.

In the *Journal of the Missouri State Medical Association* for May, 1916, HEMPELMANN points out that the various methods of transfusing human blood may be divided into four classes, namely: (1) those in which the vessel of the donor is connected directly by means of sutures or special cannulæ (Crile) with the veins of the donee; (2) those in which a hollow needle is introduced into the vein of the donor and another needle into the vein of the donee, and the blood aspirated into a syringe and expelled into the donee's vein by means of a two-way cock, or by disconnecting the syringe (method of Lindemann, Unger, *et al.*); (3) the methods by which the blood is drawn into paraffined glass tubes and then reinjected into the vein of the patient before it has time to clot (Kimpton, Brown, Curtis, *et al.*); and (4) those in which some anticoagulating medium, such as hirudin or sodium citrate, is added to the blood, which is then reinjected into the vessel of the patient. Hirudin is somewhat toxic, so that now the addition of sodium citrate is usually practiced. It seems to be harmless in the dilute solutions used for transfusing, namely, 0.2 to 1 per cent. The method was first worked out and described by Hustin of Brussels, who published his paper in May, 1914. During the spring of 1915 Richard Lewissohn and Richard Weil described the same method, both working independently and without knowledge of Hustin's work.

The syringe, cannula, and paraffined tube methods all require a certain amount of technical skill on the part of the operator, special instruments, skilled assistants, and can usually be carried successfully only in a well-equipped operating-room. The citrate method, on the other hand, is so simple that almost any physician can successfully carry out a transfusion without the use of special instruments or skilled assistants, and the proceedings may be done in less than one-half hour at the patient's home without moving him from his bed. It is because of these advantages over the older methods that Hempelmann has thought it worth while to bring the citrate method to our attention. There may be differences of opinion as to the best way of transfusing, but he believes there can be no question as to the many advantages the citrate method has for emergency work, and especially in the treatment of protracted hemorrhage. It has been found that after a certain amount of blood has been lost there is frequently an oozing which is at times uncontrollable, due to a change in the blood itself and the formation of thrombi which are soft and friable and not capable of occluding the vessels effectively. This occurs even in persons who are not bleeders in the usual sense. If, however, fresh blood is added by means of a transfusion, not only is some of the lost blood replaced, but prothrombin and platelets are added. Experience has shown that the thrombi, which form after a transmission, effectively block the vessels and the hemorrhage frequently ceases. Strange as it may seem, the addition of sodium citrate *in vitro* in no way interferes with this action on the clotting of the blood *in vivo*, either as to coagulation time or consistency of the clots.

The Lewissohn operation is performed in the following way: 5 Cc. of a 10-per-cent sterile sodium citrate solution are placed in a graduate, a rubber tube is then placed about the arm of the donor, a rather large needle is introduced into the vein of the donor, and the blood is allowed to flow in a stream into the citrate solution until 250 Cc. has been collected. This makes a 0.2-per-cent solution of citrate in blood. An assistant stirs the citrated blood with a glass rod while it is flowing into the receptacle.

Then another graduate is filled, and so on until one has collected as much blood as one wishes. The citrated blood is then poured into a salvarsan apparatus and injected into the patient's vein in the usual way, care being taken not to inject too fast in order not to cause dilatation of the heart. The citrated blood may also be placed on ice and kept several days (even as long as six days) before being injected, without any detrimental effects, even the oxygen-carrying capacity of the red corpuscles not being affected in any way by this delay. The only danger connected with transfusion is due to incompatibility of the blood of the donor and donee—that is, the blood of one being hemolytic or agglutinative for the other. Tests for hemolysis and agglutination should be made before every transfusion, except in desperate cases. These tests can be carried out in about one to two hours according to a special "rapid" technique. A Wassermann is also indicated, if time allows. Contrary to the usual opinion, hemolysis is quite as apt to occur in the blood of two blood relatives as in that of strangers.

THE CHOICE OF CLIMATE IN CASES OF BRIGHT'S DISEASE AND NEPHRITIS.

In the *Boston Medical and Surgical Journal* of May 4, 1916, HINSDALE states that Bright's disease and nephritis are diseases clearly amenable to climatic treatment. Apparently the first requisite is that the air and soil shall be warm, sunny, reasonably dry, and free from malaria and disagreeable atmospheric changes. It is a disease attended by extensive degenerative changes in the renal and circulatory organs, and hence it is highly necessary to insure an abundant and undisturbed action of the skin. The locality should be conducive to an out-of-door life the year round. This is the well-known advantage of the climate of Southern California, where the little rain that falls never does any one any harm.

The best course is to advise a warm climate first—one having moderate elevation and only a moderate rainfall, with small diurnal variations in temperature, the humidity being, perhaps, secondary in importance to temperature and wind.

The fact that other localities in the extreme northwest, such as the States of Washington and Montana, as well as Colorado, Minnesota, Wisconsin, Michigan, and Utah, have such diverse climate, and, nevertheless, fall in the favored group, should not determine their choice as health resorts for renal cases, but would indicate some advantage in the character of the population, and that the sum total of the elements of climate in those localities is conducive to a hardy race.

THE TREATMENT OF HEMORRHOIDS BY INJECTION.

In the *Lancet* of April 15, 1916, SWINFORD states that after reading a number of articles on this topic he determined to try this method amongst the out-patients at St. Mark's Hospital. After an experience there of a hundred cases he came to the conclusion that with proper precautions it was quite safe, and except in one or two cases absolutely free from pain. One injection sufficed to cure some, but the majority required two or three spread over some months. It failed in one or two cases owing to prolapse of the swollen piles on the patient's way home, followed by strangulation and sloughing. This was the result of neglect in obeying the instructions given—namely, to replace the piles at once should protrusion occur. These patients were afterward admitted and underwent the usual operation of ligature by Salmon's method.

The injection treatment proved satisfactory, even amongst the out-patients of a hospital. On account of the long way many had to go in returning to their homes and to a lack of intelligence in some, this is a severe test. Swinford adopted it in private, and has continued its practice ever since with satisfaction to his patients and without an accident of any kind.

Mr. Morley uses, Swinford says, the same injection he does and of the same strength—viz., 20 per cent of carbolic acid

in equal parts of glycerin and water. At first he worked with a ten-per-cent solution, but found on increasing the strength that recurrences were less frequent, nor was it attended wtih any pain. He is in thorough accord with all Mr. Morley says as to the cases amenable to this treatment, the precautions necessary for a successful issue, also as to the wonderful saving of time, expense, and sometimes of pain achieved by its adoption, but his technique somewhat varies from Morley's. It is as follows: The piles having been protruded, possibly with the aid of an enema, the patient is placed in the knee-elbow position with the buttocks opposite a good light. The parts are then sponged over with some antiseptic, as lysol and water, and the injection made through a sterilized needle. From three to six minims of the carbolic solution is injected into the center of each pile in turn. In large piles he often injects five minims in two places. The piles are then smeared with vaselin or sulphate of iron ointment, and returned as soon as possible, for the injection always causes the hemorrhoids to swell, therefore the longer they remain outside the more difficult are they to return. He advises no action of the bowel for forty-eight hours, and should prolapse occur in the meantime immediate replacement is essential.

Whilst Mr. Morley injects the piles *in situ* through an anal speculum, Swinford always gets them prolapsed first and injects them whilst still protruding, returning them immediately afterward. He is glad to hear that Morley injects all the piles at one sitting, for that is what he has always done. Several writers have advocated only injecting one pile at a sitting, but he cannot see any reason in this—an unnecessary loss of time it seems to him.

His reasons for having the piles extruded before injecting them are these: (1) It is much easier, and one is more certain of getting into the center of each pile. (2) If the piles are injected through a speculum a special long syringe, such as described by Mr. Morley, is necessary, whereas an ordinary hypodermic syringe suffices when the piles are prolapsed. (3) Piles which cannot be protruded should be left alone. They are to be cured by palliative means, such as local applications, enemata, attention to diet, and regulation of the bowels, etc. (4) An assistant is almost a necessity if a speculum is used, and should any bleeding occur on the withdrawal of the needle, is indispensable. Swinford does not suppose this is as likely to take place as when the piles are prolapsed, but it might occur, when an extra pair of hands would be useful.

A large number of cases of internal hemorrhoids can be cured by palliative treatment—by this he does not mean the use of nutgall ointment—but when protrusion occurs on exertion or at stool, when bleeding is sufficient to cause anemia and troubles arising therefrom, or when the piles protrude and require replacement, some operative interference is imperative. Before any operation is undertaken it is essential that a thorough examination should be made to avoid overlooking a rectal carcinoma or other trouble high up, an accident which even to-day is constantly happening in spite of repeated warnings from others as well as the writer. Cases fitted for injections are those of uncomplicated internal hemorrhoids which can be protruded, then returned and kept within the bowel. In hospital practice one finds really but few cases of uncomplicated piles, for most of those admitted for operation have in addition one or more of the following lesions, viz., external tags, fissure, hypertrophied papillæ, ulceration, and even fistula, or are of the interno-external variety. In a short paper on this subject, to show how comparatively few cases are fitted for the injection treatment, Swinford instanced an afternoon's work at St. Mark's Hospital, where he had 11 cases of piles to operate upon. Of these, 10 were complicated by other lesions, viz., 4 with fissure, 4 with external piles, 1 with an anal ulcer, and 1 with thrombosed internal pile. In private, however, the reverse is usually the case.

Swinford is in accord with Sir James

Goodhart and one or two other writers that this method of treatment deserves to be more generally employed than it is at present, but Goodhart seems to have arrived at this conclusion from a somewhat unfortunate experience of the immediate and after-results of operation, whether by the ligature or by Whitehead's method. His experience of the latter coincides with Swinford's. Theoretically it is splendid, but practically it is far inferior to either the ligature operation or to the clamp and cautery, so that Swinford never advises this method, and he is glad to see that it is rapidly falling into disrepute. But concerning the former, after an experience of over 6000 operations for hemorrhoids, he might say that he thinks there is no more successful operation in the whole range of surgery than is "Salmon's" ligature operation as practiced to-day. It is equally fitted to both simple and complicated cases, is devoid of risk, often but little pain is complained of, and convalescence is usually a matter of three weeks. If properly performed recurrence is so rare that it need not be taken into account. It is quite true that an anal stricture may result, but if this necessitates an operation it is generally owing to neglect or ignorance on the part of the medical attendant. If a finger is passed between the eighth and tenth day—*i.e.*, when the ligatures have separated—any suspicion of oncoming contraction is discovered and dilatation at once resorted to. In such cases at all events we can promise no further return of piles. Although Swinford has often had to dilate about a fortnight after the operation either with a bivalved speculum or with metal dilators, he has never had to resort to a cutting operation to cure this condition.

After the injection a few hours in bed are advisable, after which the patient can walk about and attend to his usual occupation. He has no pain and begins to get better at once. Often all bleeding and prolapse cease after the first injection, which may suffice for a cure. Latterly Swinford has not often had to repeat the injection, and when it is necessary a year has probably elapsed and all the symptoms are ameliorated.

The great advantages of the injection treatment are: (1) No confinement to bed except for a few hours when possible; (2) no anesthetic, and therefore no postanesthetic vomiting; (3) no pain; (4) no enforced absence from business; (5) no risk from the little operation itself and no risk of strictures or incontinence following; and (6) immediate and steadily increasing betterment.

As an advocate for this method, Swinford cannot put it stronger than by saying that if he were the subject of uncomplicated reducible internal hemorrhoids which called for operative interference he would select injection in preference to any of the recognized operations, always provided that it could be carried out by one who had had at least some experience of its simple technique.

THE TREATMENT OF ACUTE ANTERIOR POLIOMYELITIS IN THE PREPARALYTIC AND POST-PARALYTIC STAGES.

In the *New York Medical Journal* of July 22, 1916, NEUSTAEDTER points out that since the disease is directly contagious and is disseminated by healthy as well as sick carriers, prophylactic measures are essential. A strict quarantine for a number of weeks is, of course, the first requisite for the efficient protection of the public. Since he has shown that dust contains the virus in a viable condition, he advises a thorough scrubbing of the floors and frequent flushing of the streets and sidewalks. We must remember that people spit on the sidewalks and children play there. On general principles he advocates the extermination of insects as possible carriers. Milk and other articles of food, where practicable, should be boiled. Domesticated animals and household pets should receive frequent washings. Bathing in stagnant water in an infected neighborhood, the playing of children around sand heaps in parks and their congregation in playgrounds or places of amusement during an epidemic should be

prohibited. Since it was shown that the virus is readily destroyed by menthol and hydrogen peroxide, he strongly advises that the nasopharynx of the sick be frequently sprayed with a one-per-cent solution of peroxide of hydrogen, and that of the healthy children be sprayed with a solution of 0.5-per-cent menthol in liquid petrolatum. As a measure of individual prophylaxis, this has given Neustaedter good results in his practice. All these measures he advocated in the International Congress of Hygiene in Washington, D. C., in 1912. Since then it has been shown that feces contain the virus, and it would be necessary to disinfect these discharges, as well as bedpans and urinals. Bedclothes and other linen used by the patient should be thoroughly boiled.

During the febrile stage, complete mental and physical rest is imperative, and should be continued so long as there is pain, for every movement causes discomfort. The patient, therefore, should be handled with extreme gentleness; we should avoid flexing the neck or hips, or extending the limbs, or even bending the spine. Neustaedter would even forego sponging in high fever, in order not to cause pain by such manipulation. Bromides and chloral are, as a rule, efficient in alleviating pain in infants, but in older children the opiates or coal-tar preparations will have to be resorted to in extreme cases. An exclusively fluid diet and mild catharsis, when necessary, should be carefully maintained. A cold compress to the head in temperatures higher than 102° F. proves soothing.

When the acute stage passes and paralysis sets in, a more active treatment must be instituted in order to prevent possible deformities and restore such muscular function as conditions may warrant. Neustaedter's guide as to when such active treatment should be begun is when pain subsides completely, and not earlier. So long as pain lasts, even with the fever gone, he immobilizes the affected limb by putting it in a well-padded splint, and patients are invariably grateful. He has seen many partial recoveries from loss of muscular function from such procedure. During the stage of active exudate manipulation of the extremity will cause fatigue in the nerve cells, and is apt to enhance the progress of degeneration, while complete rest may, and frequently does, hasten absorption of the exudate, and restitution ad integrum of nerve and muscle is made possible. All our spontaneous recoveries are due, in a great measure, to such precautions. Warm baths during the afebrile stage are of great benefit, and the patient should be left in the bath as long as he can remain with comfort—the longer the better. With the pain gone, about a fortnight after the onset of the paralysis, we may begin with massage, passive movements, and galvanism. No more than five minutes should be allotted to these measures daily, for the structures need very little encouragement, and too much stimulation will easily exhaust them and produce the reverse of the desired effect. In using galvanism Neustaedter prefers the interrupted to the continuous current, and then only of a weak amperage, just enough to produce contractions.

Active exercise of the muscles by the patient should be encouraged, and this is best accomplished with infants while bathing daily by putting into the tub some floating toys and encouraging the patient to attempt to handle the objects with the affected limb. Older children can be persuaded to counteract antagonistic passive movements by the masseur. It may well be remembered that at times groups of cells in a given involved segment of the cord or cranial nerve nucleus may escape destruction and their function be restored, if thus encouraged. In this treatment we should persist for years. Several youngsters in Neustaedter's private and clinical practice who were hopelessly paralyzed for months, after persistent treatment for several years, have regained a fair amount of function in certain muscle groups. To avoid contractures, counteracting splints may be applied with advantage, but left on only part of the time at the beginning—for example, only over daytime, and removed at night. If no improvement is noticeable

in any muscle group after persistent treatment for a few years, it is advisable to resort to operative measures, such as tendon transplantations or other surgical measures, as the case may demand.. That the patient should at all times have a bland, well-nourishing diet and plenty of fresh air applies here as well as in all febrile and wasting diseases. In common with all clinicians Neustaedter recommends that we should do all we can, and at the right time, but in our zeal take care not to overdo.

THE TREATMENT OF INFANTILE PARALYSIS BY ADRENALIN.

MELTZER in the *Medical Record* of July 22, 1916, writes as follows:

The first requirement of a new treatment is that it should do no harm. On the basis of his extensive experience he was, and is, sure that a cautious intraspinal injection of adrenalin does no harm. As to the good it may do, he has given in his brief statement full reasons for the justification of his expectations. Will adrenalin accomplish a real cure? Any one who is trained in experimental and clinical criticism can readily see that this question cannot be answered for some time to come. On the other hand, it is quite certain that in many cases it will be of no value on account of the frequent occurrence of a steady ascending progress of the chief inflammatory focus to the origin of the phrenic nerves and to the respiratory and the vasomotor centers. The failure of adrenalin to help in some cases does therefore in no way speak against its possible usefulness in some other cases. On the other hand, the recovery of some cases does not speak definitely for the usefulness of adrenalin, since 75 per cent of the patients recover without this treatment.

This criticism is applicable to any kind of useful remedy in a disease in which the mortality is comparatively low. However, there is one form of evidence which is of actual value, and that is when an improvement is observed which has to be ascribed to the remedy. That kind of evidence he has unmistakably seen in the experimental poliomyelitis of monkeys, and Meltzer may say now that similar evidence has already been obtained in the treatment of human beings. One competent physician wrote to Meltzer July 12th the following: "So far have made observations on three cases, on the effect of intraspinal injection of adrenalin. In one case in particular the results certainly were good and resembled those obtained by Clark experimentally." Dr. J. C. Regan, resident physician of the Kingston Avenue Hospital, stated to Meltzer expressly that he is sure that the intraspinal injection of adrenalin and the administration of oxygen under pressure exert a good effect. In one case, complicated with pneumonia, recovery took place under this treatment. The immediate effect of the oxygen administration upon the cyanosis was unmistakable, and he wished Meltzer to let them keep both apparatus for the administration of oxygen for some time until they could obtain their own. Under these circumstances Meltzer is of the opinion that the treatment of poliomyelitis by the measures he suggested is not only permissible, but it would be nearly bordering on criminal neglect not to use them. This last statement is perhaps exaggerated, but at any rate it was his perfect right and duty to bring forward his therapeutic suggestions.

WHAT THERAPY MEANS.

Writing in the *American Journal of the Medical Sciences* for July, 1916, OSBORNE gives these lines of advice:

1. Not to forget to use every means to prevent the spread of the contagion and the infection of others if the disease is contagious. If the disease is not contagious, the general hygiene and care of the secretions of the nose and mouth and of the excreta are always of more or less importance.

2. If the cause of a disease can be removed or actively combated, that is the part of the treatment that takes precedence of all others.

3. If the disease, or its localization, or its lesion, or a simple condition, as a cold or a headache, can be aborted, that is another primary object of treatment. The direct

treatment of the cause (antitoxin, etc.) may do this, or local measures, as ice, heat, hyperemia, leeches, purges, simple surgical measures, etc., or various drugs may so act as to prevent, control or abort an impending lesion or functional disturbance.

4. A lesion having occurred the patient will not be well until it has disappeared, resolved, or been removed, and hence as soon as a lesion has been established it is the aim of all our science to eradicate it. Time and nature's own antagonistic and recuperative powers may unaided accomplish this object, but very frequently we can aid and hasten nature's processes by various means. Frequently only surgery can remove a lesion. At other times a lesion becomes permanent and the patient is permanently damaged to that extent. He may be apparently well in spite of this defect, or he may be well as long as he so modifies his food, life, and activities; or he may be an invalid; or the lesion may be the cause of his death, sooner or later. However, in any of these eventualities the management of the lesion and its pathological results is the main object of treatment.

5. Whether or not the lesion can be successfully treated, objectionable or disturbing symptoms must be stopped or ameliorated. No one but the consultant and textbooks can refuse to treat symptoms; the practicing physician must and should treat symptoms. The banal phrase of "symptomatic treatment," pointed at with finger of scorn, must be now recognized as of great importance under the new name of the "necessary treatment of symptoms." Pain cannot and must not be suffered, lest cardiac depression and exhaustion occur. High, prolonged fever must be reduced, not every little temperature. Too high blood-pressure must be combated, and circulatory failure must be guarded against and combated when present. Almost all acute diseases will cease and the patient will recover, provided his heart can be sustained. It is the heart age. The heart fails and the patient dies even before we have got well into our fight against the disease. We have come from the bleeding, vomiting, purging, starving age, through the aconite and alcohol ages, to the feeding and strychnine age —all showing the change of heart both in ourselves and in our patients. Now too much strychnine is given.

6. Students are not sufficiently taught, and the practitioner does not often enough consider the disturbances of function due to, or caused by, the disease that is present. Medical students are so engrossed in the pathology, differential diagnosis, prognosis, and specific treatment, if there is any, as to get the whole idea of the subject under the caption of "the patient who has the disease." Hence the patient himself and his disturbed physiology or disturbed functions are forgotten, to his detriment. Just what functions may be disturbed, of course, depends on the disease, the lesion, and the prominent symptoms, but it is an axiom that disturbances will occur, and they should be corrected if possible.

The life processes must go on in illness as they do in health, nutrition must be kept up, excretion must occur, repair by sleep must take place, and the organs concerned in these life processes must be coaxed into the greatest efficiency possible with the handicap that they are enduring.

7. The diet must of necessity be modified by the intensity of the illness, and the condition of the organs of digestion. The food and drink must always be carefully considered, regulated from day to day to meet the conditions, and then gradually increased during convalescence, or perhaps be modified by a lesion that is permanent.

8. Of course, we wish to hasten convalescence, but have we always carefully enough studied our partially healed patients to scientifically decide just what rapidity in the complete recovery we should expect? Generally we have not done so.

A too low systolic blood-pressure, below 105 mm. in an adult, should prohibit his sitting up and certainly his attempting to walk. Too many long, tedious heart weaknesses from strain occur after operations and after severe illness because patients are allowed to get up too soon. The appendix patient up and out in ten days is a cardiac

and abdominal risk that should not be advocated.

Again, all physical means of massage, graded exercise, fresh air, change of scene and of climate, or location at least, should be considered in hastening recovery and making that recovery complete.

MEANS OF PREVENTION OF INFANTILE PARALYSIS.

In the *New York Medical Journal* of July 22, 1916, FLEXNER says there is at present no safe method of preventive inoculation or vaccination and no practicable method of specific treatment. The prevention of the disease must be accomplished through general sanitary means; recovery from the disease is a spontaneous process which can be greatly assisted by proper medical and surgical care.

THE TREATMENT OF PARESIS.

In the *American Journal of Insanity* for April, 1916, EVANS and THORNE in discussing the use of salvarsanized serum state that the great imperfection of this method seems to lie in the small quantity of salvarsan given and in the long intervals that must elapse between its administrations. A large dose of salvarsan is too irritating and cannot be borne by the patient, and if the treatments are given at shorter intervals one is simply withdrawing a part of the serum last injected, because it takes nearly two weeks for the serum to be absorbed from the spinal arachnoid space.

The spirochætes that survive the first dose have an opportunity to multiply and continue their work of destruction before the next treatment can be given.

A patient with a very small lesion in the brain at the beginning of a series of treatments will have a much larger one before the invading organisms are finally killed off.

The largest number of intraspinous treatments given to one individual was ten, and the smallest number three.

Three of these patients showed mental and physical improvement; five showed physical improvement only; two died during the course of treatment; two died ten and thirteen months, respectively, after treatments were discontinued; the remainder showed no improvement whatever.

Of the three who showed mental and physical improvement, one was discharged and still remains in good physical and mental condition, having "returned to work and received a substantial raise in salary," over fourteen months having elapsed since last treatment. One showed first signs of improvement three months after receiving last treatment. He was taken home by his friends, and Evans and Thorne have lost track of him. The third died with convulsions ten months after treatment.

The number of treatments which they have given to each patient was insufficient to reduce the intensity of the Wassermann reaction either with the blood or the cerebrospinal fluid. The negative reactions they have obtained may be seen in almost any case of untreated paresis.

The number of cells in the cerebrospinal fluid change with each lumbar puncture independent of any medicinal agent. It is generally reduced to a greater or less extent, but in some instances it may be increased and the changes in the number of cells, following intraspinous treatments, are the same as those following lumbar puncture without treatment.

The improvements which the authors have observed following their treatments may be seen among the same number of paretics who have received no special treatment.

The number of treatments they have given are insufficient to control the course of the disease in patients who are as far advanced as they usually are when admitted to institutions for the insane.

They believe that the amount of salvarsan which can be introduced safely into the central nervous system is too small, and the intervals are too long between the treatments, to be of any great value in moderately advanced cases.

The intracranial method seems to be unnecessary. The same results can be obtained with the intraspinous method.

THE TREATMENT OF THE ACUTE STAGE OF ANTERIOR POLIOMYELITIS.

BASS in the *Archives of Pediatrics* for August, 1916, states that the chief object to be attained in the earliest stage of the disease is to keep the patient absolutely at rest. The child should be disturbed as little as possible, in order that the inflamed portions of the nervous system may be kept quiet. Picking up the patient or moving him about must be strictly avoided, not only because the spine should be kept at rest, but on account of the pain caused by even the slightest motion. The most noticeable feature of the disease outside of the paralysis is the extreme hyperesthesia. This applies not only to the affected extremity, but also to the entire spinal region, in particular to the neck. Bass has seen a number of children who could not lie on their backs on account of pain when they rested on the spine. In such cases there is a marked arching of the spine, as if the child were afraid to allow the back to rest on the bed.

To insure complete rest Machol, of Munich, has recommended putting the affected limbs in plaster casts as soon as the paralysis has become evident, and leaving these in place until the acute stage of the disease has passed; also immobilizing the spine by a plaster-of-Paris jacket. Occasionally considerable relief follows this procedure.

Further relief of the pain and hyperesthesia may be accomplished by means of drugs—bromides, codeine, and morphine in appropriate dosage. Aspirin is also useful as an analgesic in doses of 2 to 3 grains t.i.d. for a two-year-old child. Local application of heat in the form of a hot-water bag should be tried. Warm baths have been highly recommended for their sedative effect, but they would appear to do more harm than good, since they necessitate too much disturbance of the patient.

The bowels should be treated as in any acute infectious disease, and retention of the urine, which occasionally occurs, must be remedied.

The appetite does not seem to suffer in proportion to the seriousness of the illness, for even in the severest forms of the disease the children partake readily of food. During the febrile stage fluids and semisolids should be given, but as soon as this stage is past the child may have solid food. In the cases in which the muscles of deglutition are involved and in the severely toxic cerebral forms gavage may be necessary, though this is exceptional, and then only needed for short periods of time. In the last mentioned type, in which emaciation is often rapid, the use of normal saline solution by rectum is highly beneficial.

Where the respiratory center is involved, life may be prolonged by the use of insufflation apparatus, artificial respiration, or by galvanization of the phrenic nerve; but though Bass has kept patients alive for hours by these means, he has not seen any cases thus treated recover.

Even early in the disease it is of the utmost importance to guard against increasing the deformity of the paralyzed parts by allowing them to remain in improper attitudes. Drop-foot is especially to be guarded against owing to the tendency to be pressed down by the bedclothes. A frame or cradle of some sort should be employed to keep the covers from touching the foot, and the nurse should be warned against tucking in the bedclothes tight. The foot of a paralyzed extremity should be held at a right angle to the leg by means of a sand-bag placed against the sole, or by a strip of adhesive plaster about the ball of the foot running up on the leg. Such a simple contrivance may avoid a tenotomy later on. Fingers begin to show contractures within the first weeks of the disease, and should be straightened gently and kept partly extended by some simple device.

Hexamethylenamine is generally recommended on account of its action as a germicide in the spinal canal. It should be used in relatively large doses and only during the first week of the illness. During its administration the urine must be carefully watched for signs of renal irritation. Its use is somewhat empirical, but in monkeys

it has been shown to be of value in some cases when administered early in the disease.

The seat of the disease being in the cerebrospinal nervous system, it would appear rational to administer remedies directly into the spinal canal. This has been done by Netter, who has reported 32 cases treated by means of intraspinal injections of serum from persons who have already passed through the disease. He performed lumbar puncture and withdrew as much fluid as came away, and then injected a slightly less amount of the serum. He used serum of patients who had poliomyelitis from twelve days to eleven years before. The serum was apparently most potent when collected from persons who had suffered from paralysis three months to four years previously. A Wassermann reaction was done on each of the donors to rule out syphilis. The blood was collected in sterile flasks and was then sterilized by repeated heating. Netter injected 5 to 13 Cc. (depending on how much cerebrospinal fluid was withdrawn) daily for eight days. He describes several cases in which an apparently rapidly spreading paralysis was stopped at once by the treatment.

Quite recently the intraspinal injection of a solution of adrenalin has been advised by Meltzer.

Lumbar puncture alone has been advocated especially by Roemer as a therapeutic procedure. It would seem indicated in cases in which there are signs of increased cerebrospinal pressure, but even in such cases Bass has not seen any especially favorable results following its use.

When all signs of acute inflammation have disappeared, gentle massage and passive motion of the affected parts should be begun. According to Peabody, Draper, and Dochez, the best guide for this is the disappearance of the pain and tenderness. Electricity may then also be employed.

Rest in bed should be insisted upon for several weeks after all apparent acute symptoms have subsided, and isolation should be continued for six weeks.

In all cases in which paralysis of the larger muscles remains, expert orthopedic advice is indispensable and should be secured early.

ADRENALIN IN POLIOMYELITIS.

MELTZER writes in the *Archives of Pediatrics* for August, 1916, that it is highly probable that in many instances of infantile paralysis the respiratory paralysis is not produced by the chief inflammatory focus, but by the extensive peripheral zones of exudation and edema, which are surely capable of interfering with the vitality of the nerve centers controlling the respiratory mechanism. If the exudation and edema could be removed for some time, the life of a few or of many of the cases might be saved, namely, if in these cases it just happens that the ascending progress of the actual inflammation comes to a standstill. On the basis of these facts and considerations he recommends the injection of adrenalin intraspinally in every case of infantile paralysis, the injections to be repeated from four to six hours. The procedure may save life, and in surviving cases it may reduce the extent of the final lesion. There is no danger to this procedure. Monkeys stand well as large a dose as 2 Cc. in a single injection. However, in human infantile paralysis the injections should be begun with a dose of 0.5 Cc. of adrenalin, until more is learned about the effects.

There are two other suggestions Meltzer wishes to make. One is to administer artificial respiration by means of the apparatus for pharyngeal insufflation as soon as the patient shows a degree of unconsciousness and respiratory insufficiency. It is an easy and reliable procedure. The second suggestion is to administer oxygen under pressure in a respiratory rhythm by an apparatus which he has recently devised and used on human beings in several instances. It abolishes rapidly cyanosis and may save life. It may even act specifically on the virus of poliomyelitis.

THE VALUE OF AUTOSERUM INJECTIONS IN SKIN DISEASES.

In the *New York Medical Journal* of June 24, 1916, GOTTHEIL reports his investigations and reaches his conclusions, which are as follows:

1. In psoriasis the autoserum treatment, while not in itself curative, is an important factor in the treatment. It cuts down the time required for the troublesome local treatment from weeks to days, and enables us to promise to clear the skin in from two to five days in even the worst and most obstinate cases. It postpones relapses for a long time, possibly indefinitely. In most cases it so influences the type of the disease that the relapsing lesions are few and insignificant, and are readily amenable to mild local treatment.

2. In chronic urticaria, neurodermatitis, pruritus senilis, and other obstinate itchy dermatoses, it is worthy of trial. In some cases its action is effective and brilliant.

3. It is of some value in bad pustular acne; but in furunculosis, folliculitis, and other pus infections Gottheil has not found it useful.

4. In chronic eczema the same may be said as of acne; the injections are sometimes apparently effective, and at others fail entirely.

5. In pemphigus, lepra, and obstinate lichen planus it is ineffective.

6. In syphilis it is useless.

THE ACTION OF GAMMA RAYS ON DEEP-SEATED INOPERABLE CANCERS OF THE PELVIS.

In the *Official Bulletin of the Chicago Medical Society* of June 24, 1916, SCHMIDT gives this summary:

1. The therapeutic action of radium depends on the use of a correct technique, which must be based on a careful physical examination of the patient and the physical properties and the biologic action of the metal.

2. The use of massive Roentgen rays, according to multiple field and cross-fire methods, in conjunction with radium therapy, to destroy metastases, is an imperative necessity.

3. Certain surgical procedures must be used in radium therapy to assist the action and facilitate the application of the rays.

4. The action of *x*-ray on cancer tissue is specific and suggests positive proof of the possibility of destroying malignant tumors by the application of radium.

5. The results of radium therapy in inoperable and recurrent cancers surpass those of any other known therapeutic agent.

6. The prophylactic use of radium rays in operable carcinomata increases the percentage of operability and probably the efficacy of the operative procedures.

SOME OBSERVATIONS ON THE EFFECT OF EMETINE ADMINISTRATION ON THE FREE VEGETATIVE FORMS AND CYSTS OF ENTAMEBA HISTOLYTICA AND ENTAMEBA COLI.

In the *Journal of the Royal Army Medical Corps* for June, 1916, J. G. THOMSON and D. THOMSON report their studies on this subject. They conclude as follows:

1. If an amebic case receives a continuous course of treatment with emetine of not less than a total of seven to ten grains of the drug administered in grain doses daily for a week, it is probable that he will never become a carrier of cysts. In order, however, to make certain of this, it is better to carry the treatment further. Such treatment also prevents relapses.

2. Cysts of E. histolytica can be cleared out of a patient after six grains of emetine, but to make absolutely certain of this it is better to exceed this dose. This treatment must be combined with saline purgatives, so as to get free daily action of the bowels.

3. A case of amebic dysentery inefficiently treated with less than seven grains of emetine is likely to become highly dangerous as a carrier of cysts. One or two small doses may act beneficially and get rid of active symptoms, such as the passage of blood and mucus, but it may at the same time stimulate the formation of cysts. The cessation of treatment on the disappearance of active symptoms is fraught with danger,

both to the patient and, subsequently, to others.

4. All patients known to have blood and mucus in their stools and to have received less than an efficient total quantity of emetine ought to be examined for the presence of cysts in the feces, as it is highly probable they have thereby become dangerous carriers.

5. The transmission of dysentery is undoubtedly due to the ingestion of cysts. This is brought about by the contamination of food by the fingers, or by flies. Cysts may also be carried along with sand particles by the wind.

6. The powers of resistance of cysts outside the body are considerable, and this should be borne in mind by all responsible for sanitary prophylactic measures against dysentery.

REMOVING THE TONSILS.

I. W. and Y. W. FAISON in the *Charlotte Medical Journal* for June, 1916, state they feel they must say something to men who are removing tonsils. First, don't remove a tonsil unless it is diseased. If you do remove it, take time and do it as a regular surgical operation. Do not by carelessness and hurry cut the pillars or any of the anatomical tissue about it. Dissect out the capsule in its entirety, so no stump can be left as a focus for evil conditions. Do not be weak enough or ignorant enough, if your patient comes back in two or three years for removal of the same tonsils, to say that they have grown back. If you will take time and dissect out completely the tonsil and capsule, the tonsils cannot grow back.

THE COCKROACH: ITS DESTRUCTION AND DISPERSAL.

HOLT in the *Lancet* of June 3, 1916, reports a long series of experiments on this subject:

Summarizing the results of the experiments as a whole, they seem to indicate that many of the substances which have been supposed to kill the cockroach have really acted by driving it away and so leading to its disappearance. Such gregarious migrations have been observed, but have hitherto been otherwise explained. For quick destruction stoving with bromine or sulphur dioxide is apparently best. For domestic application the daily use of creosote, wood naphtha, or the oil of rosemary, eucalyptus, or citronella placed near the haunts of the cockroaches for two or three weeks, should effectually disperse them. Where these are inadmissible on account of their smell, odorless dusting powders may be used. Of these sodium fluoride was found to be the most effective. It is also cheap and keeps indefinitely.

These experiments may have some value as applied to insect pests. The cockroach being abundant and of large size, it has been possible to use it as an "indicator" and to observe the results more accurately than would be possible with small insects. Other things being equal, the same results should follow in the case of many other insect pests.

THE USE OF THE "KARELL CURE" IN THE TREATMENT OF CARDIAC, RENAL, AND HEPATIC DROPSIES.

GOODMAN in the *Archives of Internal Medicine* of June 15, 1916, reminds us that the technique of the Karell cure is simple and easily carried out as far as the physician is concerned. The patient receives daily at 8 A.M., 12 M., 4 P.M., and 8 P.M. 200 Cc. of boiled milk, warm or cold, according to taste. No other food or liquid should be given. This strict diet sometimes, nay, many times, meets with violent opposition from the patient, and great complaint is made because of thirst. Thirst is particularly tormenting during the first three or four days of the "cure," and often it becomes necessary to allow the patient to rinse out his mouth with water, instructing him to swallow none, however. Hunger is not so common a complaint, but when urgent a small piece of dry toast or zwieback may be given with each portion of milk. During the first few days the patient requires continual encouragement to persist with the treatment, but the moral effect of

the rapid loss of weight, as shown by daily weighings, together with the very evident decrease of the edema, proves sufficient argument to him, and no further complaint is heard. Just how long this very strict diet is to be continued depends on the rapidity with which edema diminishes and on the patient's plea for more food. Usually the diet may be increased at the end of a week's time by giving a soft-boiled egg, without salt or pepper, at 10 A.M., and a piece of zwieback at 6 P.M. The next day an egg may be given at 10 A.M. and at 2 P.M., with a piece of white bread, and from now on food is gradually increased until a full diet is being taken. During this time the daily quantum of liquid should not exceed 800 Cc., and this fluid should be in the form of milk, until the patient receives a full diet, when the milk may be discontinued and cocoa or tea substituted, the amount of liquid remaining the same, however. No more than 800 Cc. of fluid should be taken from two to four weeks after the disappearance of edema.

The "full diet" spoken of above is a misnomer, for the diet should be salt poor, and the following foods comprise this dietary: meat, fresh-water fish, cream soups, fresh eggs cooked in any form or raw, rice, corn, hominy, Indian corn, endives, peas, string beans, French beans, artichokes, onions, leeks, carrots, salads except lettuce, cauliflower, potatoes, cereals of all kinds, butter unsalted, bread without salt, sweetmeats, sugar, chocolates, cocoa, tea, coffee, fruits, milk, cream cheese and Swiss cheese, puddings, junket, ice cream.

During the "cure," which it seems needless to say must be carried out with the patient in bed, the bowels must be kept open, and for this purpose laxatives in pill form are preferable to salines, merely because they require no water for their administration. In a typical case—that is, in those individuals who begin to lose weight through the loss of edema, and who show increased diuresis—no other medication is required, but where improvement is not seen at the end of three days, or when symptoms are urgent, such as dyspnea, oppression, restlessness, unduly frequent and weak pulse, or active uremic signs, the drugs and other measures usually indicated in such conditions should be used.

During Goodman's experience with the Karell cure there have been no bad results when the treatment has been properly used. There are cases, however, which do not seem to respond to the diet, and for this reason the Karell treatment is no longer recommended in these instances. Patients exhibiting symptoms of uremia should not be put on the Karell cure, which restricts the fluid intake to a minimum, as it has been shown by Senator and others that in this crisis the fluid intake should be greatly augmented for the purpose of flooding from the system the unknown toxic substance or substances believed to be the causative factor in uremia. Wittich states that the Karell cure in two cases of uremia left him absolutely in the lurch, and the patients were made materially worse. The treatment of such individuals should be that well known to all practitioners of medicine, and the Karell cure has no place whatever in the management of such cases.

OBSERVATIONS ON THE TREATMENT OF ANAPHYLAXIS.

In the *Lancet* of June 10, 1916, LEYTON claims that the treatment of anaphylaxis, at least in the guinea-pig, is not entirely hopeless, if due preparation is made. Rosenau and Anderson state (and Leyton's experience coincides with theirs) that untreated guinea-pigs never recover if the anaphylactic condition has proceeded to the convulsive stage. It is therefore noteworthy that the injection of alcohol or of spirit of camphor has in some cases averted death even after convulsions have begun. In four out of eight animals recovery took place after marked symptoms of anaphylaxis had set in, while among untreated animals showing only slight symptoms only 11 out of 43 recovered. The subcutaneous administration of alcohol in human cases of sudden collapse after the injection of serum is therefore worthy of trial. Leyton has attempted also to deal prophylactically wtih the individual symptoms exhibited by the anaphy-

lactic guinea-pig. In this animal both heart and lungs appear to be involved. The injection of camphorated oil just before the toxic dose of serum generally inhibits the respiratory signs; there is no cough, and after death the lungs are not unduly distended and do not show any petechiæ. But camphor will not avert the fatal issue, although it thus counteracts the respiratory signs, so that presumably respiratory failure is not the determining cause of death.

The effect of anesthesia on anaphylaxis is a matter of dispute. Besredka has said that it inhibits the phenomenon, while Rosenau and Anderson assert that it does not. In this case it would almost seem as if the negative must outweigh the positive observation. Leighton has not investigated the point himself, but as a nervous element is almost certainly involved in anaphylaxis, he has tried certain drugs, alone and in combination, acting both centrally and peripherally on the nervous system. By administering one or more of them before the serum, he has successfully averted anaphylaxis in a large percentage of instances. The drugs which he has used successfully are hyoscine, scopolamine, morphine, and atropine. Before recording the results he wishes to point out a possible source of confusion and disappointment. Although the alkaloid is said to exist in four isomeric forms, the British Pharmacopœia does not distinguish between them and uses the names hyoscine and scopolamine (levorotatory) as synonyms. Accordingly at least one well-known firm (A) calls its levorotatory alkaloid "hyoscine" and does not use the term "scopolamine" at all, while another firm (B) supplies two different substances under the two names. Leyton obtained preparations labeled "scopolamine" (levorotatory) and "hyoscine" (racemic) respectively, and discovered a marked difference of action between them. Put shortly, it may be said that only hyoscine B was of use by itself in invariably averting anaphylaxis: scopolamine B mostly did so, but hyoscine A, which is presumably identical with it, was of no use alone.

The doses given were, per 500 gm. of guinea-pig, of hyoscine or scopolamine hydrobromide, 1/400 grain; of morphine sulphate, 1/24 grain; and of atropine sulphate, 1/600 grain. The results are given in tabular form.

These results show that, in combination, both hyoscine (B) and scopolamine (A) have a distinct influence in preventing anaphylactic shock, but only hyoscine will do so by itself. This Leyton attributes to the more central action of hyoscine as compared with the more peripheral action of scopolamine. It is therefore the preferable drug to use, but apart from other reasons, owing to the uncertainty of obtaining it and not an isomer, it is well always to order the combination with morphine and atropine. Morphine and atropine by themselves do not possess any noteworthy protective power, but appear to counteract the dangerous properties of hyoscine.

Drugs.	No. of tests.	No. of survivals.	No. of deaths.
Hyoscine (B)	10	10	0
Hyoscine (B) + Morphine + Atropine	4	4	0
Scopolamine (B)	6	5	1
Scopolamine (B) + Morphine + Atropine	7	4	3
"Hyoscine" (A)	3	2	1
"Hyoscine" (A) + Atropine + Morphine	36	32	4
Hyoscine (D)	10	8	2
Hyoscine (E)	15	15	0
Total	91	80	11
Controls	63	24	39

Judging from the medical war literature so far published, anaphylaxis does not seem to have occurred so often as to have called for comment. Nevertheless, Leyton would recommend strongly the employment of hyoscine previous to the injection of serum for a second time in any case in which the interval since the previous injection has exceeded one week. Inasmuch as the soporific effect of hyoscine in the case of guinea-pigs is but little marked as compared with man, we may hope that it will be even more efficacious in human beings than in animals.

SOME CONDITIONS IN WHICH VACCINE THERAPY MAY REASONABLY BE EMPLOYED.

GREELY in the *Long Island Medical Journal* for June, 1916, points out that in vaccine therapy one principle stands out very prominently, in fact it is the leading one, in view of that basic principle of practice requiring one to be at least sure he is doing no harm.

This is it:

If there is reason to believe that all the susceptible cells of the patient are being stimulated by substances arising from the infecting agents, do not give a vaccine, for there is hardly a chance but that it will tend to swamp, by overstimulation, the normal reaction of the cells upon whose response cure depends.

The reason that greater harm is often done by indiscriminate vaccine therapy is the common use of stock vaccines in minute doses, and the fact that most patients can stand much more bad treatment than we think.

When is there reason to believe that all of a patient's susceptible cells are being stimulated to produce antibacterial substances? When the general constitutional symptoms of infectious disease are present: fever, rapid pulse, prostration, etc. Well-developed lung tuberculosis is an excellent condition in which to study the possible ill effects of injudicious vaccine medication. With it a patient is often so nicely balanced between improvement and decline as to respond most noticeably to beneficial or injurious influences; and the same is true of his lungs.

After a dose of tuberculin, what occurs in a tuberculous lung probably varies as follows:

If the disease process is early and the bacilli not accompanied by an accumulation of tubercular materials, the reaction in no wise differs from that which would occur in like circumstances with any other infection. Accordingly the increase in the digestive power of the blood over the bacilli causes the disintegration of some or all, and this digestive process is either so complete as to leave no irritating products to harm the neighboring tissue cells, or else such products are not formed in sufficient amounts to do serious harm.

However, when the tubercular process is more advanced and its products are accumulated in greater amount, any sudden increase in the specific digestive power of the blood looses such an amount of disintegration products that the tissue cells in the immediate neighborhood are swamped and many are digested by the tubercular products, just as tubercle bacilli may be by the blood serum. Thus it is that tuberculin often produces breaking down of tuberculous lung tissue, and is therefore usually indicated in advanced disease, certainly in all cases, early or late, of the disease while showing fever.

Surgical tuberculosis, after any existing abscess has been drained, is, however, most suitable for the treatment and very striking results have been obtained by its use.

[Tuberculin is not a very apt choice to illustrate the effects of vaccines.—ED.]

It seems strange that vaccine treatment of gonorrhea is not more frequent. Even during the acute stage, if there be no constitutional symptoms, as fever, it is possible that great good might be accomplished. However, when the acute manifestations of the disease have subsided there can be no question but that the total eradication of the organisms can be best accomplished through the use of vaccine. [This opinion is open to question.—ED.] An autogenous vaccine may be easily made by taking a plant during the acute stage, when organisms are plentiful, and to be obtained in pure culture with little difficulty. If distinct varieties (or strains) of gonococci exist, as is claimed, it may be of great importance to have the vaccine autogenous.

The suitability of gonorrhea for vaccine therapy is also indicated by the usual lateness in the disease of the appearance of the blood reaction sufficient to give a positive complement fixation test.

In a case suspected to be one of chronic gonorrhea, the use of a vaccine could give great assistance in the diagnosis, as in a

positive case a focal reaction, increased discharge, etc., would certainly follow the first one or two injections. Of course, a local (at the point of injection) and even a constitutional reaction might accompany it.

These principles furnish such strong contraindications to the employment of vaccines in the treatment of pneumonia and of typhoid that something more than the mortality tables and personal impressions quoted by some who have tried them is required to justify their use. The same is true of all infectious processes with continued constitutional symptoms, especially fever.

An ideal condition for vaccine treatment is presented by chronic articular rheumatism. Here the infectious agent, the streptococcus, is present in small numbers in areas only reached by a much diluted plasma. Before proceeding with a course of vaccine treatment in such a case it is, of course, desirable to remove, if possible, any existing probable primary focus of the infection, such as suppurating teeth roots, or a chronically inflamed gall-bladder or appendix. If this be not done the supply of bacteria within such entrenchments, and there usually safe from the effects of a course of vaccine treatment which would otherwise completely cure the rheumatic symptoms, will be very apt to cause relapses. Just as soon as the specific power of the blood has fallen from the point to which it was raised by the vaccine, some of the bacterial colonists, that must frequently escape from such foci, will infect the susceptible joint tissue and the disease will return. In some cases of chronic rheumatism it seems that the gastrointestinal tract in general is the focus from which the joints are invaded, and therefore, in all cases treated, it behooves one to see that it is working normally. Any one who is particularly interested in the subject of the vaccine treatment of rheumatism will find considerable in recent literature on the subject.

Another common chronic infectious process that is very suitable for vaccine treatment is acne, and, if one uses an autogenous vaccine made of the organisms that appear in great numbers in smears from pustules, good results will accrue. With ordinary precautions to see that a patient's general condition is good, vaccine will usually effect a cure of these cases in a few weeks. Some are undoubtedly very intractable, however, and although great improvement may always be got, complete cure seems impossible. Often, upon investigation, it will be found that the intractable cases have a carbohydrate intolerance, as evidenced by occasional appearance of sugar in the urine or at least an abnormally high percentage of sugar in the blood. Furthermore, severe relapses may often be traced to an increased consumption of sugar, as in candy or in grapes.

Furunculosis is an allied condition which is also most suitable for vaccine therapy, but it, even more than acne, is frequently much influenced by sugar intolerance.

In chronic infections of the nose, ear, or bladder, before thinking of vaccine therapy one must always determine whether there is not some predisposing condition requiring surgical treatment. An antrum of Highmore full of pus, a badly drained suppurating ear, a bladder with stone, are certainly not to receive vaccine treatment until the surgical indications have been fulfilled. Then if cure does not immediately follow, a vaccine can be reasonably employed.

INTRAVENOUS SALINE IN CHOLERA—A CONTRAINDICATION.

In the *Indian Medical Gazette* for May, 1916, MAJUMDAR points out that though true cholera is unknown in Port Blair, yet there are some very severe cases of acute diarrhea during the summer months which are clinically indistinguishable from real cholera. During the prevalence of these choleraic diarrhea cases some rare cases are found which become almost or quite pulseless and which do not react at all to intravenous injections, even with the exhibition of adrenalin or pituitrin.

The difficulty of recognizing such cases has now been practically done away with,

as every one knows, by the introduction of the routine testing of the specific gravity of blood before starting the saline, viz., that intravenous injection is not indicated with a specific gravity below 1060. Taking the specific gravity of blood is undoubtedly the surest and best guide in well-equipped hospitals, but the writer is afraid that this cannot always be availed of by medical practitoners who do not get such a sufficiently large number of cholera cases as to keep a proper cholera outfit with the test bottles. In such cases he has found the following a sufficiently good though a bit crude guide: if on holding the arm just above and below the elbow, the veins at the bend of the elbow become fairly turgid on the application of some extra pressure inward (*i.e.*, toward the bend of the elbow), the case should not be given any intravenous injection. The turgidity of the veins shows that they are fairly full and that the absence of the pulse is not so much due to any marked deficiency in the quantity of fluid in the vessels as to the loss of vascular tone and cardiac weakness from the severity of the toxemia; and introduction of any extra quantity of fluid is not only not indicated but is positively harmful, as it would entail an extra amount of work on the already weakened and embarrassed heart.

The writer is not aware if any one else has made use of this as a guide as to the advisability of an intravenous injection, but he has found it useful and demonstrated its usefulness to others.

THE INFLUENCE OF SALICYLATE ON METABOLISM IN MAN.

In the *Journal of Pharmacology and Experimental Therapeutics* for June, 1916, DENIS and MEANS state their results show from careful investigation that in the case of two normal men the administration of large doses of sodium salicylate (up to 6.6 grammes per day) produces an increase in the excretion of nitrogen, phosphates, and uric acid. In one case this increased nitrogenous metabolism was accompanied by an increase in the basal metabolism, and symptoms of salicylate intoxication (such as ringing in the ears). In the other case a much greater increase in the urinary excretion of nitrogen (which extended throughout the after period) was observed, but there was no increase in the basal metabolism and no symptoms of intoxication. In one mildly septic individual results similar to those secured in the second case were obtained. No change in the respiratory quotient occurred in any of these subjects.

DELAYED GASTRIC DIGESTION.

REHFUSS in the *New York Medical Journal* of June 10, 1916, reaches these conclusions:

1. There is a pathological deviation from the normal gastric secretory output in which there is either a delay in the appearance of the secretion, in reality delayed gastric secretion, or a delay in the evolution of the normal acid content, delayed gastric acidity resulting in delayed gastric digestion.

2. In a large series of studies on normal subjects this phenomenon was never encountered, indicating therefore that its appearance is unquestionably pathological.

3. It is not characteristic of any one type of gastric disturbance, being found in atony, gastritis, ulcer, carcinoma, and many of the functional disturbances, but its manner of evolution and the concomitant findings throw light on the disturbance.

4. The condition, in the absence of organic disturbance, is fairly frequent and can be adequately demonstrated by the fractional method.

5. It can be experimentally produced by the administration of hypertonic solutions, such as those of dextrose and sugar.

6. It may or may not be associated with motility disturbances.

7. In many of the extrinsic affections producing gastric disturbances, such as appendicitis, cholecystitis, intestinal adhesions, phenomena of delayed digestion with the ultimate evolution of high acid values and hypersecretion are found, although the initial period of gastric digestion indicates no such tendency.

8. The explanation of delayed digestion must be found in either a disturbance of the psychic or chemical factors dominating gastric digestion, although it is probable that mucosal changes (gastritis), the elimination of toxic substances (toxemias), a disturbance in autonomic balance (nervous), a disturbance in certain internal secretions, as well as an actual disturbance in chemical equilibrium, are capable of inducing secretory disturbances. Concerning these points Rehfuss will have some data to present in the future.

9. Many of these cases are rebellious to treatment; others can be relieved by treatment of the underlying cause.

THE TREATMENT OF HAY-FEVER.

The *New York Medical Journal* of June 10, 1916, states very truly that the subject of hay-fever and its treatment is literally of perennial interest to a large number of persons. A voluminous literature and extensive experimentation have been devoted to it. Hitchens and Brown (*Journal of Laboratory and Clinical Medicine,* April, 1916) have added a recent contribution concerning their own experience and clinical confirmation of earlier work, and summarizing the principles of treatment in the light of our present knowledge.

They divide the active treatment into measures to be taken two to three months previous to the hay-fever season and the control of the acute attack. For the former a survey should be made of all flowering plants within the patient's habitual surroundings in order to determine what particular pollens are responsible. The skin tests are to be made with the pollen of each to determine its specificity. The method of preparation of the pollen extract for treatment, as recommended by Hitchens and Brown, is as follows: The flowers are gathered and dried when pollination has just started. The pollen is collected on fine sieves and thoroughly dried for preservation. When the extract is to be prepared, the dry pollen is made up into a paste with physiological saline, and this is ground in a porcelain ball mill until the pollen grains are completely broken up. After centrifugation, the extracted protein is precipitated with acetone and the precipitate dried for future use. When ready to be used, the precipitate is redissolved in saline and the protein nitrogen is determined. The solution is then diluted so that each cubic centimeter will contain a certain definite fraction of protein nitrogen. This gives a fairly exact and satisfactory standardization of strength. These dilutions are preserved with trikresol, sterilized by filtration, and the sterility is tested.

Hitchens and Brown report sixty-two cases treated with such vaccines, of which eighteen were complicated with asthma. Of these eighteen, eleven were entirely relieved, three were considerably relieved, and three were not reported. Of the remaining forty-four cases, seventeeen were entirely relieved, eighteen were considerably relieved, and three were not reported. One patient who was treated in summer and autumn for two years was apparently cured. The two vaccines used by the authors were, in the spring, a mixture of pollens from red top, timothy, rye, and orchard grass, and in the fall, the pollen of ragweed alone. They call attention to the fact that in every case the possibility of a concurrent bacterial infection must be taken into account.

In regard to the treatment of acute attacks Hitchens and Brown have recommended immediate use of the vaccine which seems most likely to be efficacious, and at the same time a determination of the exact diagnosis as if there were no immediate symptoms. They condemn without reservation the practice of putting pollen extracts into the conjunctivæ for diagnostic purposes, and believe that the skin reaction, while perhaps not so delicate, is sufficient for clinical use and less dangerous.

These authors point out that many persons who died from injections of horse serum were found later to have had an anaphylactic asthma whenever they came near horses. There is no doubt that many persons are sensitized to animal odors and to the dust from animal fur; this is some-

times seen as asthmatic attacks after handling guinea-pigs in the laboratory.

Hay-fever has joined the class of anaphylactic phenomena which includes certain types of asthma and very likely many as yet undifferentiated forms of coryza. Immunization as well as a specific cure is certainly to be hoped for as a result of the manifold investigations being made along the lines on which we have commented.

A STUDY ON FOOD AND ITS FUEL VALUE.

In the *Journal of the American Medical Association* of June 3, 1916, WILSON and RATHBUN reach these conclusions:

1. In all institutions for the care of the tuberculous, food studies, including the caloric content of the dietary and food waste, should be carried on at regular intervals, preferably for one week or more during the various seasons of the year, and these records should be made available for comparative purposes.

2. Special training, though advisable, is not a necessary requisite for the carrying out of a successful dietary study in an institution. It is, of course, essential that the doctor who directs the work should be thoroughly familiar with the problem. It is only necessary that the person or persons who are doing the work should be intelligent, careful, and willing to follow conscientiously the "rules of the game."

3. The elimination of meats and eggs from the morning meal and the substitution of milk is a sound and justifiable economy.

4. The dietary of the tuberculous should be high in caloric value, but confined to three daily meals in all but exceptional cases.

5. Males consume more food than females, both in total amount and in number of calories per pound of body weight, but in spite of this fact females make much larger gains than males, enough so to indicate that rapid accumulation of weight is a characteristic of the female sex.

6. The avoidance of frequent repetition of foodstuffs is very important.

7. A four weeks' menu is of great aid to those controlling the dietary, and tends to do away with repetition.

8. The treatment of small children, in separate units, in institutions with adults, is both feasible and advantageous in that it results in economy of foodstuffs.

9. Small initial servings with as many "seconds" as may be desired are satisfactory to the patients and prevent much plate waste.

10. The plate waste in institutions for the tuberculous is of necessity higher than in hospitals for the insane or in general hospitals.

CITRATED MILK FEEDING FOR INFANTS.

In the *Practitioner* for June, 1916, POYNTON states that in his opinion it is a practical error to advocate placing infants on citrated whole milk from the first. He does not deny that such a method may be repeatedly successful, but it introduces a risk which is not worth taking. Pure cow's milk may not, even if citrated, suit a particular infant, and no one can tell beforehand when such an infant may appear. Why then use whole milk at first, when it is neither necessary nor safe? Why not, as Poynton originally suggested, begin with dilute milk until we have tested the infant's reaction to cow's milk, and then quickly increase the strength of the milk? One reason Poynton had for writing the original paper was to combat the danger of children being kept upon dilute milk too long, but he had no intention of suggesting that any risk should be taken in the opposite direction, seeing that if there is one lesson we have to learn in the feeding of infants, it is to begin hand feeding with caution. Personally, he thinks it is a great pity if any mystery should arise around the use of citrate of soda in infant feeding. It is very useful, especially in dealing with the poor, for it is cheap and handy. It is often very successful, especially for the correcting of milk dyspepsia, and has survived, he is delighted to think, more expensive and much vaunted "substitutes." Nevertheless, the

routine use and prolonged use are not advisable.

Some children take cow's milk quite well of the strength of 2 of milk to 1 of water, without the citrate, and when Poynton gets to that strength, he always tries and diminishes the citration with a view to its suspension.

The use of very dilute milk with large quantities of citrate of soda may result in general anasarca and convulsions. It was never intended for use in large quantities in dilute milk. If a child is so delicate that it is thought advisable to feed it upon very dilute cow's milk, it is not wise to try and increase the digestibility of the milk with large doses of citrate of soda. Sometimes it produces, however carefully used, an irritant diarrhea, although, with deference to Sir A. E. Wright and other writers on the subject, Poynton is just as convinced as he was ten years ago that its tendency is to cause constipation.

Many times he has noticed a precaution he insisted upon originally, but overlooked, viz., to increase the citrate in proportion to the milk, and not to the mixture of milk and water. The result of this oversight is to impair the value of the treatment.

Some writers have thought this drug causes undue nervousness, and the occurrence of epileptiform attacks is interesting in this relation. Poynton has not noticed any such result himself from the use of sodium citrate, but he has never, for example, given it to a healthy child of eight or nine months as a routine, and in the proportion of gr. ij to the ounce of milk. Obviously, to persevere, month after month, with what must amount to a large quantity of the drug when it is not the least necessary, may lead to trouble; if it does not, it deserves to.

Citrate of soda is not always successful, but it is very useful when properly given, and is not, as some would appear to believe, a mere substitute for bicarbonate of soda. Poynton personally prefers a solution to the tablets. He only uses it for a purpose, and not as a routine. He always tries to remember that the commencement of hand feeding should be cautious, and that it is not our successes but our failures that count. He does not advocate starting small infants on citrated whole milk, because, in his opinion, it is asking for trouble, which a little patience would obviate.

PEDICULOSIS PUBIS.

The *Canadian Practitioner and Review* for June, 1916, contains an article on this topic by MONTGOMERY. He recalls the fact that the old treatment for "crabs" was blue ointment, and it is wonderful, considering the number of clean, innocuous, effective parasiticides now available, how the use of this dirty application persists. It is not alone dirty, it is particularly liable, when employed in the genital region, to give rise to a severe dermatitis. This accident is due to both a peculiarity of the metal itself, and also to the situation affected. Mercury volatilizes at all temperatures higher than zero, and the higher the temperature the greater the volatilization, and the greater also its activity on the skin. As for the locality, the privates constitute a particularly warm corner, and the vapor is retained by the density of the hair and the fit of the clothing. The hair follicles in this region are also quite large and permit of the entrance of the metal, and the development of folliculitis. If the patient is fat and sweats a great deal, as fat people are apt to do, the trouble is still further accentuated. Further than the fact that the pruritus leads to rubbing and therefore to the more intimate inunction of the ointment, the presence of the disease itself does not lead to any hypersensitiveness to mercury, as at one time was thought. As showing that the location has more to do with the occurrence of the dermatitis than the kind of disease, one of the worst cases Montgomery has recently had was due to the application, by a very obese young man, of mercurial ointment for eczema marginatum.

In the treatment it is well to remember that these pediculi are provided with tracheæ or breathing tubes of most ex-

tensive distribution, through which many of the petroleum products easily permeate, and so smother them. Many of these petroleum products are very little noxious or not at all so to the human skin, are clean, and therefore form ideal means of ridding one of these pests. Xylol is one of these.

Xylol or dimethyl benzol is a clear fluid, with a peculiar, rather agreeable odor, and readily miscible in alcohol and ether. It has a wonderful power of penetrating tissues, a quality that makes it a favorite in clearing up microscopical sections. Sabouraud advises a lotion composed of:

Xylol, 50.00;
Ether,
Alcohol, āā 25.00.

M. Sig.: Moisten a wad of absorbant cotton with this and rub into the affected regions.

This will kill instantly and absolutely both the pediculi and the nits, but its application is quite painful, especially on the scrotum.

Creolin is a better petroleum product for this purpose than xylol. It is composed of orth-metra and paracresol in varying proportions. It is miscible in water, and as such is much used by poultrymen for killing insects. It may also be incorporated with fat to form an ointment. It is rarely noxious to the human skin. Montgomery has never seen it so.

Creolin, 10.00;
Vaselin, 90.00.

M. Sig.: Rub well in once a day.

This ointment not alone kills the insect, but is antipruritic and curative of any eczema that may be present.

Betanaphthol, in an ointment of five-per-cent strength, is also excellent for this disease, and for any incidental pyogenesis or eczema. Several severe poisonings have arisen in the employment of betanaphthol in scabies, but this was on account of the large areas, almost the whole cutaneous surface, treated. There is absolutely no danger in applying it to the much more restricted districts in pediculosis pubis.

In regard to the prognosis, it is as well not to be too quick in promising a complete relief from all disagreeable sensations, as the pruritus in some people endures long after the pediculi have been completely killed, and an eczema started by them may be as difficult and as tedious to master as in any other situation or beginning from any other cause.

The nits that give a knotty feeling to the hair are very annoying to some people. They may be slid off by using a comb dipped in vinegar.

DIET IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

Writing upon this topic in the *Practitioner* for June, 1916, MUTHU states that to some extent the nutritive value of foodstuffs depends upon the physical and mental condition of the patient. The individual who takes his food with pleasure will assimilate it easily, even to the extent of nullifying any noxious qualities of the foodstuffs themselves; whereas he who has repulsion for his food will digest it under the most unfavorable conditions, and distil toxin from the most nourishing foods. This will explain why of two patients eating the same quantity of food, and living under the same environment, one will gain and the other lose. The gain of weight is not in proportion to the quantity of food taken. Nor is it always an index to the patient's improvement in the condition of his lungs. Muthu has seen active mischief continue in fat patients, and arrest of disease take place in those with slender frames. It is surprising how little women patients eat as compared with men and still gain weight.

The maxim "laugh and grow fat" is scientifically true. A patient with a placid temperament gets more nourishment out of a smaller quantity of food than one with a restless and irritable frame of mind. Behind food lies the power of digestion and assimilation, and behind these again the condition of the mind. Worry and anxiety, mental strain and stress interfere with the physiological functions of the stomach and healthy metabolism. The common saying

that a person cannot eat when he is in love has a profound truth behind it. A patient filled with a calm satisfaction and peace of mind does not want much to eat. Nature laughs at our scientific calculations, our food values in grammes and calories, and brings from her hidden stores materials wherewith to feed her children. Therefore the sanatorium physician, in arranging the diet of the patients under his care, should take into consideration their mental condition and temperament, their habits of life and idiosyncrasies. Only by discretion and individual attention, by neither underfeeding nor overfeeding them, by coaxing the thin to eat more and persuading the obese to eat less, and, above all, by placing them in a happy and cheerful frame of mind, can he successfully wage war against tuberculosis.

BLOOD-PRESSURE IN HEMORRHAGE AND ITS RESTORATION.

In the *American Journal of Physiology* of June 1, 1915, DOWNS reports experiments, his object being to determine what could be hoped for in the way of restoring blood-pressure and maintaining the circulation in cases of hemorrhage of varying degrees of severity. From these observations he draws the conclusion that so long as the hemorrhage has not been great enough to reduce blood-pressure to the "shock level" gratifying results may be hoped for from the intravenous administration of normal salt solution. When the blood-pressure has reached the level of shock, 30 mm. to 50 mm., restoration of blood-pressure and maintenance of the vital functions of the organism are a possibility, but cannot be expected with any certainty. In general it can be stated that in hemorrhage injection of amounts of saline solution in excess of the amount of blood lost will give the best results; in severe cases the use of large amounts of normal salt solution, 50 to 100 Cc. per kilogram of body weight, is most likely to be attended by a successful outcome. [These amounts seem to us very excessive.—ED.]

THE OCCIPUT POSTERIOR.

In the *Bulletin of the Johns Hopkins Hospital* for June, 1916, PLASS quotes the late Professor C. D. Meigs, who in speaking of these cases said: "Beware of meddlesome midwifery, and, if one is to err in these cases, better err on the side of waiting." This bit of advice, Plass thinks, is just as true now as when it was written, but the improvements in aseptic technique, by eliminating many of the former horribly fatal results, have led to haste in obstetrical work. The knowledge of when to interfere is as important as the mere technique of performing the usual forceps operations, but good judgment is much rarer than good operating ability. The profession generally seems to have been so impressed with the statement that occiput posterior positions will very frequently need operation that they do not wait to see whether the individual case will make that demand, but proceed to deliver instrumentally on the smallest provocation, and often on none whatever.

The more conservative writers have reported a small operative incidence. Thus, Naegele noted 11.8 per cent forceps deliveries, P. Dubois 7 per cent, Battaillard 10 per cent, Dupré 3.64 per cent, Botkowskaia 10.75 per cent in primiparæ and 2.5 per cent in multiparæ. Corinin gives the incidence of spontaneous labor as 96.23 per cent, Dimitroff as 93.9 per cent, Mosher as 90 per cent, Lacrotte as 87 per cent. In these series the figures were taken from cases which were normal in every other respect, and indicate the interference necessary in uncomplicated occiput posterior labors. In an early section Plass has considered 11.02 per cent of his operative deliveries as possibly due to the position.

In contrast to these figures indicating that the uncomplicated occiput posterior should nine times out of ten be delivered spontaneously, Bill reports that 50 per cent of his cases of occiput posterior needed forceps, and details rather incompletely 137 cases in which the double application of forceps was employed. Many of these operations were done with the head still

high in the pelvis and, judging from the context, through a partially dilated cervix. Again, Lukins has recently stated: "The ideal plan of management in occiput posterior positions, provided the patient can be seen and the diagnosis made sufficiently early, is to hasten cervical dilatation by manual means and accomplish immediate version by combined internal and external manipulations."

The statement in the last paragraph illustrates what an unenviable reputation the position in question enjoys, and what radical methods are introduced in order to obviate difficulties which really do not exist. Evidence might, indeed, be introduced to show that there are physicians who seriously advocate the employment of the Cæsarian section in the absence of any other indication. In the light of the writer's experience it is difficult to see how such errors have arisen.

Of the many published methods of treating the complication, if there really be one, very few have any sound reason to commend them. Postural treatment, with the patient lying on the same side as the occiput or on the other side, as is variously recommended, is certainly of little value, as is attested by the lack of unanimity of opinion with regard to which side is preferable.

Correcting the obliquity of the uterus by means of pads and binders seems futile. Manual rotation of the head at the superior strait and the correction of improper flexion digitally have a sound basis, but are rarely indicated. O'Brien's method of rotating the mother around the child, by fixing the latter manually, seems not only awkward but useless, when one considers how readily the reverse can be accomplished. The double application of forceps distinctly has a place in the treatment of the unrotated occiput, but is indicated only when rotation cannot be accomplished manually. The single application of forceps with the blades reversed, or reversing, has no distinct field of usefulness when there are so many simpler methods that have not the obvious disadvantages of these procedures.

The chief point in the treatment is to give nature a chance, and not to fall into the common mistake of thinking that the position itself will cause trouble. A large portion of the cases will need no assistance, and the majority of those that do demand help will offer no great difficulty. Spontaneous rotation will usually occur, but if it does not, at least 90 per cent of the heads can be rotated manually to the transverse or obliquely anterior positions and then delivered by a single application of the forceps. Podalic version is useful in certain cases, but should be reserved for those in which the indication for delivery arises while the head is still at the brim and the choice lies between high or floating forceps and version. High forceps are being more and more discarded, as operators realize the excessive fetal mortality usually consequent upon the procedure. Rarely does the posterior position of the occiput itself call for interference while the head is still at the brim, and the exercise of a little more patience will usually be rewarded by its descent and eventual anterior rotation. Cæsarian section distinctly has no place in the treatment, unless there is some other definite indication, such as contracted pelvis, and then the occiput posterior is not what demands the section.

As has already been stated, Plass views these cases with equanimity, and, in consequence, the patient is treated exactly as if there was any other uncomplicated vertex presentation. He does not insist that she assume any particular position, nor does he attempt to apply any abdominal pads or binders. No attempt is made to correct improper flexion or to rotate the occiput forward. The spontaneous cases are, of course, simple; if the occiput has rotated into the hollow of the sacrum, it is permitted to be born as such. There is probably, on these latter cases, a greater possibility of perineal lacerations, but these are never extensive enough to be of serious moment.

In applying forceps a certain routine is followed. In the first place, the vulva and vagina are manually dilated until they

admit the clenched hand; a cephalic application of forceps is then made, the posterior blade being introduced first over the posterior ear with the hand in the vagina definitely feeling the ear; the other blade being introduced posteriorly and rotated over the face to lock with the first. The patient is allowed to come partially out of the anesthetic while short intermittent but frequent tractions are made. If the occiput is directly anterior or posterior, a pelvic (of course, also, a cephalic) application is made and the head delivered directly. If the occiput is obliquely anterior or transverse, a cephalic application is made, and during the tractions a slight rotary movement of the blades accelerates rotation. With the occiput still obliquely posterior, the hand in the vagina grasps the head securely between the four fingers and the thumb, and rotation is attempted, the occiput being turned as far anterior as possible. The position of the head is immaterial, for this procedure can be successfully carried out even when the head is tight against the perineum. During the maneuver the head may be pushed up slightly, but this is rarely a disadvantage. In rather rare cases the head will not remain in its new position and falls back to the obliquely posterior position. Here one can attempt the double application with little better chance of success, or deliberately apply as for the opposite anterior position and rotate through 45 degrees so that the occiput becomes directly posterior. Although this procedure cannot be very warmly recommended, it has a certain field of usefulness, especially in the class of cases just mentioned and in others, particularly in patients with relaxed outlets, where haste is imperative. The Scanzonian or double application of forceps is rarely necessary. The blades are first applied for opposite anterior position and the occiput rotated forward to a transverse or an obliquely anterior position while downward traction is employed. The blades are then removed and reapplied for the new position, and delivery is completed with the occiput under the symphysis.

THE SECRETION AND EXCRETION OF SALVARSAN AND NEOSALVARSAN.

In an interesting paper read before the Society of Public Analysts Mr. John Webster, F.I.C., presented the results of some analyses showing the relative amounts of arsenic found in the various organs after injections of salvarsan and neosalvarsan. Special attention was drawn to the relatively very high proportion of arsenic present in the kidneys. In one case a post-mortem examination had shown that nephritis was present. Various analyses of urine were made showing the variability of the rate of excretion. Analyses of human milk from two cases of salvarsan treatment were referred to, and the results indicated that after a dose or repeated doses of salvarsan the milk of a lactating woman is entirely, or almost entirely, free from arsenic. A minute trace of arsenic was found in one specimen only. Mr. Webster expresses the opinion that any official results to the syphilitic child fed on such milk cannot be due to the presence of salvarsan or other compound of arsenic present in the milk of the mother.—*Lancet,* May 13, 1916.

PARALYSIS DURING PASTEUR ANTIRABIC TREATMENT.

In the *Journal of the American Medical Association* of June 3, 1916, FIELDER reaches these conclusions:

1. Paralysis complicating the Pasteur antirabic treatment is very rare, but doubtless occurs in mild form more often than is known. It affects adults chiefly, young children almost never.

2. The prognosis is good in cases of mild or moderate degree, but the mortality among the severe cases is high.

3. The administration of antirabic treatment is therefore not entirely devoid of risk.

4. The possibility of the occurrence of paralysis in any particular case, however, is so slight that it should not deter us from using antirabic treatment in those who evidently need it. A person bitten by a rabid animal is much more likely to de-

velop rabies, which is certainly fatal, than paralysis, which usually ends in recovery.

5. The slight risk of paralysis should always be explained to those who are inclined to insist on antirabic treatment in the absence of clinical or laboratory evidence that the biting animal was rabid.

6. In most instances this paralysis is caused by the antirabic treatment itself (fixed virus infection, or toxin, or both). It is not often due to street virus infection modified by treatment. Its incubation is shorter than that of most cases of street virus rabies.

7. Variations in the strength of the fixed virus used are probably a factor in the etiology.

8. Personal idiosyncrasy is an important predisposing condition.

TREATMENT OF DEVASCULARIZED INTESTINE.

DAVIS (*Interstate Medical Journal*, May, 1916) notes that the usual surgical practice, in the presence of perforating wounds at the junction of the mesentery and the bowel, is resection of the segment of intestine involved. This procedure is based upon data, gained from pathologic study and surgical experience, which indicate that, for practical purposes, the arteriæ rectæ passing to the intestine from the parallel vessels of Dwight are end arteries; that while, anatomically, anastomoses between adjacent vessels may be demonstrable, they cannot be depended upon to maintain an efficient blood supply in case the artery to a particular segment suddenly becomes occluded.

Recently published results from experimental laboratories do not appear to be in harmony with these generalizations. It is reported that segments of intestine (ileum near ileocecal junction) several inches in length may be devascularized by ligation of the mesenteric vessels at the border of the bowel without impairment of function, especially if the devascularized segments are protected by a wrapping of omentum. In regard to this Horsley and Coleman say: "It has usually been taught that if a bowel is deprived of its nutrition from the mesentery even for a short distance, a resection should be done. These experiments demonstrate that, in the dog at least, a loop of 4 or 5 inches of intestine may be deprived of its blood supply through the mesentery and may still survive if omentum is wrapped around it and fastened in position. In long abdominal operations, where for some reason the mesentery has been severed from the bowel and the patient's condition does not admit of a resection, it appears justifiable to wrap the omentum around this portion of the bowel and stitch it to itself and the intestine with a reasonable expectation that the segment will be properly nourished through the omentum.

"Azara concludes from experiments on fourteen dogs that separation of the mesentery over a stretch of 5 cm. along the margin of the bowel does not compromise it beyond repair, and that up to this distance, therefore, treatment may be conservative. With separation over a stretch of 6 cm. the function of the intestine is so seriously compromised that resection is required unless there is a strip of mesentery at least 1 cm. wide still attached to the intestine. Devascularization of a segment of intestine 18 or more centimeters in length, even though the mesentery be preserved for a distance of 3 cm. from the bowel, entails inevitable gangrene. Ligation of the vessels supplying segments of bowel not exceeding a length of 15 cm. at a distance of 3 cm. from the intestine is never followed by gangrene, but occasionally functional disturbances are caused by the development of cicatrix. According to Scandola interference with the blood supply of a loop of intestine affects the mucosa primarily. Whenever the injury to the intestine is limited to the mucosa, complete recovery is the rule. Quite serious changes in the mucosa may retrogress, but pronounced alterations in the outer layers inevitably prove fatal. Complete restitution may occur in a loop of intestine the blood supply to which has been interrupted for six hours.

In normal dogs a loop of small intestine

one inch in length may be completely separated from its mesenteric blood supply with relative safety, although gangrene with perforation and general peritonitis may occur, and replacement fibrosis of the devascularized segment with consequent narrowing of the bowel lumen may occasionally be expected. The frequency of one or the other of the above accidents increases rapidly as the length of the devascularized segment is increased, until at a segment length of 4 inches gangrene with complete destruction of the involved loop or replacement fibrosis with contraction becomes the rule.

Wrapping omentum about devascularized bowel appears to influence the final result but little, certainly not enough to justify the confident assertion of Horsley and Coleman, whose error and the reason therefor have been demonstrated by the results of the experiments in Series I and II of this paper. The value of omentum in walling off inflammatory foci is universally acknowledged, and the abundant vascular channels which may develop in omental adhesions justify the Talma operation; but neither of these conceptions may be applied with safety to the conditions now under discussion. Gangrene is not an inflammatory process; it is characterized by the absence of inflammatory reaction in the tissues directly involved. Such tissues die. The fate of a segment of intestine suddenly deprived of its mesenteric blood supply depends entirely on the size, number, and patency of its intramural collaterals, for the changes following devascularization occur so rapidly that there is no time for vicarious revascularization through fresh adhesions. If a devascularized portion of intestine becomes gangrenous just after it has been wrapped in omentum, the intestinal contents are poured directly into the enclosing omentum and the resultant peritonitis is only a matter of minutes. If the mucosa only is involved, restitution may occur independently of enclosing omentum, though if the defect is large cicatricial contraction may be marked. The deeper the defect in the intestinal wall the more imminent is perforation, or failing the latter, cicatrix with contraction. Omentum wrapped about devascularized intestine cannot avert gangrene in the slightest, and, should gangrene occur, it may prove efficient if the gangrenous area is small in extent, but it cannot be depended upon to confine the intestinal contents and prevent peritonitis.

Among the factors which may cause variation in the results of the separation of equilinear segments of intestine from their mesenteric blood supply may be mentioned at least four: First, the quantity of normal intramural channels: thus injury at the upper end of the jejunum should offer a better prognosis from the standpoint of the maintenance of the integrity of the bowel than similar injury at a point low down in the less vascular ileum. Second, the elasticity of the intramural channels; gangrene might be expected to occur in individuals with arteriosclerosis more commonly than in those not thus afflicted. Third, the circulatory pressure: patients in shock from loss of blood or other cause, or who are suffering from some wasting disease, such as typhoid fever, offer a less favorable prognosis than individuals who, excepting for the lesion at the mesenteric border, are normal. Fourth, and probably most important, is the factor of thrombosis, and especially septic thrombosis, since septic thrombi frequently become propagating thrombi. No matter what the number or elasticity of the intramural vessels and regardless of circulatory pressure, thrombosis will insure complete devascularization, and therefore gangrene, wherever it involves any appreciable extent of intestine.

Segments of small intestine which have become separated from the mesenteric blood supply for a distance of 4 inches or more demand resection. Shorter segments may be treated conservatively, though the risk is great, and a fairly safe rule would be to resect all devascularized segments which exceed one inch in length. Segments less than an inch in length will rarely require resection, although there is a definite risk in non-interference.

To depend upon omentum to maintain

the vitality of devascularized loops of bowel is to invite disaster.

Dangers associated with the conservative treatment of devascularized segments are: Gangrene with perforation and peritonitis; or intestinal obstruction by contracting scar tissue.

POSITIONS OF ELECTION FOR ANKYLOSIS FOLLOWING GUNSHOT INJURIES OF JOINTS.

JONES (*British Medical Journal*, April 29, 1916) observes there are certain injuries to joints occurring after gunshot wounds which must inevitably end in bony ankylosis. From their very nature some of these will not admit of excision.

When a joint has been shattered, and the muscles governing it have been in part or wholly destroyed, excision is not merely difficult from the point of view of surgical technique, but often results in a flail articulation which renders the limb quite useless. This is especially the case when such joints as the shoulder, elbow, and wrist are concerned. Excisions of the upper part of the humerus are frequently practiced as a conservative procedure in the presence of acute or persistent sepsis, especially at the French front. This may be very necessary, but the resulting condition will at a later date require further surgical intervention. The question has often been put, "What should be done with these flail joints, and if ankylosis is to be expected, in what position should the joint be placed in order to be of the greatest use to the patient?" It may be of service to indicate the conclusions as to the positions for ankylosis to which experience has led.

If the shoulder is to become ankylosed the arm should be abducted to about 50 degrees. The elbow should be slightly in front of the coronal plane of the body, so that when it is at right angles and the forearm supinated, the palm of the hand is toward the face. The arm is placed in this position while the scapula retains its normal position of rest.

If the arm be correctly placed, the hand can be brought easily to the mouth by bending the elbow. Further, the humerus being fixed to the scapula at the angle indicated, the arm can be lifted to a considerable height by scapular action; moreover, pockets can be reached, the hair brushed, and the patient can pick up a plate or cup without spilling the contents.

The arm should never be kept to the patient's side if ankylosis is feared, for in such a case the functional result must be most unsatisfactory; not only will it be difficult to reach many parts of the body, but difficult also to reach across a table or to perform many simple movements constantly recurring in every-day life.

Flail shoulder-joints also should be ankylosed in the position described, and joints which have been allowed to ankylose in an adducted position may require osteotomy of the humerus high up to correct this faulty position. The shoulder-joint should never be allowed to become fixed at right angles to the side in adults, as in that case the patient will be unable to bring his arm down to his side. It is to be clearly understood that the writer is dealing with injuries to soldiers and sailors, and not with children, in whom other means can be adopted owing to anatomical considerations.

As to the elbow-joint the proper course to adopt will depend upon the patient and his calling, but by far the greater number of men would prefer the fixation to be at just below a right angle—that is, about 100 degrees. It is important to bear in mind that in cases in which both elbows will become ankylosed it is necessary to fix the one at an angle of 80 degrees and the other at 100 degrees as recommended for one-sided trouble. The ankylosis commonly met with at 130 degrees is not useful.

This position enables the patient to move his hand to his mouth, button his clothes, brush his hair, and to reach over a table. At an angle less than a right angle it is certainly more easy to get the hand to the mouth and to various parts of the head, but limitations in other directions more than counterbalance these advantages.

If the movements of pronation and supination are lost, the radius should be

fixed midway between pronation and supination. The hand is more useful for dressing and eating and for manual labor in this position. A minor advantage is that of appearance.

All injuries of the wrist-joint should be treated with the wrist dorsiflexed. This is a priceless surgical axiom, the neglect of which is grave. It is an urgent necessity where ankylosis is expected, or where even limitation in movement is likely to occur.

The common deformity of palmar flexion occurs when no splint is applied, or from the use of a straight splint; in all cases in which the arm and fingers are kept on such a splint palmar flexion of the wrist occurs, and this condition is a lifelong handicap to the usefulness of the hand.

The grip of the fingers is diminished if the wrist is palmar-flexed. The strong flexors overpower the extensors of the fingers, and in consequence proper coördination of the finger movements is impaired. The grasp of the hand is strongest when the wrist is in the dorsiflexed position, the balance between the flexors and extensors is better preserved, and the coördinated movement of the fingers is secured.

The splints required are simple.

In proof of the importance Jones attaches to the dorsiflexed ankylosed wrist, he states that he always restores hyperextension of the ankylosed joint from the position of flexion by manipulation or incision. This invariably improves the grip of the fingers.

Apart from the impairment of function, a flexed wrist is unsightly.

As to the hip, ankylosis should be encouraged in a position of very slight abduction, with thigh extended and very slight outward rotation. The common deformity in ankylosis of the hip is flexion, adduction, and internal rotation, which is the characteristic position we find in an untreated or imperfectly treated tuberculous hip-joint; it leads to lumbar lordosis and an ugly limp. Adduction deformity brings the limb too near the middle line, interferes with the normal position of the sound limb in walking, and, by involving abduction of the sound limb, interferes also with a free gait.

If the hip-joint is ankylosed in the fully extended position, lordosis and the consequent trouble from backache is avoided, and there is freer pelvic movement in walking if the thigh is slightly abducted.

The limb should be very slightly rotated outward, to avoid the unsightly lift of the pelvis as the patient rises on his toes when walking, due to the immobile condition of the hip-joint. This gives an easier walk than if the toes are pointed straight forward.

Very good reasons may be given in favor of slight flexion from the point of view of elegance in repose and that of ease in mounting stairs. Due weight should be given to these arguments, but in case of war injuries the straight position obviates many risks. Ankylosis, as we know, is not necessarily bony; when it is fibrous the tendency is for the flexion angle to increase by exercise. The incidence of the body weight on a slightly bent knee, unless the ankylosis is sound and bony, will increase the flexion. The position, therefore, is mechanically a weak one for carrying body weight. Even when new bone is forming its complete consolidation is sometimes a slow process, and if the surgeon places such a knee in a slightly flexed position the degree of ultimate flexion is often much greater than he would wish. The advantage of increased strength and stability assured by an extended joint will generally outweigh all other considerations.

The foot should be kept at a right angle with the leg, so that the sole impinges on the ground in a slightly varus rather than a valgus position.

If the reader will recall the ankylosed ankles he has seen, he will remember that most of them were in a valgoid position. A varoid position conduces to a strong type of foot; a valgoid (flatfoot) to a weak foot, and all the disability associated with erroneous deflection of body weight.

In gunshot wounds and other injuries of the tarsus and metatarsus, the deformities to be feared correspond to the common static deformity of flatfoot—that is to say, to pronation at the midtarsal joint, flatten-

ing of the longitudinal arch, and sometimes flattening of the transverse arch associated with pain in the metatarsophalangeal joints. Callus exudation added to plantar malposition results in a very crippled foot. In all gunshot injuries of tarsus and metatarsus the surgeon should take care during the later stages of healing not to bandage the sole rigidly against a flat foot-piece, for if that be done every irregularity of bone will conduce to callosity when walking is resumed. It is necessary, therefore, at this stage to adjust a splint having an inside arch padded to conform to the natural shape of the foot. Eversion of the foot should be guarded against, and the hollow of the arch should when possible be emphasized. Later, the heel of the boot should be raised on the inner side to obviate eversion, and if the metatarsals are involved, in order to allow of early walking, a bar should be placed across the sole of the boot behind the tread. Light duty can then be undertaken at a much earlier date.

In answer to the question, "What should be done with flail joints?" Jones says: "Secure by operation an ankylosis in the most useful position." The only exception is in the case of the hip-joint, where by means of simple mechanism a very useful limb may be obtained in spite of the joint being flail.

A REVIEW OF THE POSTOPERATIVE CASES OF PNEUMONIA IN THE SECOND SURGICAL SERVICE OF THE NEW YORK HOSPITAL.

BANCROFT (*Medical Record*, March 25, 1916) states that during the year 1915 there have been 15 cases of pneumonia in 1413 operations, or 1.06 per cent. Of these cases of pneumonia seven had died, or 46.6 per cent, giving a total mortality of 0.5 per cent from this complication.

A brief history of each of these cases and of the operation performed showed that of the seven fatal cases three deaths followed general peritonitis; one of these patients died at the end of the third day, another on the twenty-fourth day, of pneumonia secondary to pulmonary embolism, and the third died of pneumonia secondary to suppurative pleurisy, due to subphrenic abscess. The other four deaths were due respectively to typhoid appendicitis, strangulated inguinal hernia, pelvic inflammatory disease, and cholecystitis, and should have been avoided.

The diagnosis of the eight cases that recovered was chronic appendicitis (three cases), ventral hernia, gastrostomy for carcinoma of the esophagus, inguinal hernia and hypertrophied tonsils, inguinal hernia, and cholelithiasis. Two of these cases were lobar pneumonias and six bronchial pneumonias. The onset occurred on the first day in three cases, and in one case each on the second, third, fourth, fifth, and eighth days. All persisted from four to eight days and subsided by lysis. The *x*-ray taken in two cases showed signs like those of tuberculosis. The age of the youngest of this series was four years and the eldest sixty-two.

Every one of the 15 operations was a laparotomy. The shortest operation lasted fifteen minutes and the longest sixty minutes, the average time being thirty-six minutes. The time of the year did not seem to be a factor, since three cases occurred in March and three in August, and one each in the other months. Three of the fatalities were in cases of severe peritonitis, and the pneumonias might have been of the terminal type.

The anesthesia in 11 of the fatal cases was gas and ether (Bennett inhaler, followed by the drop method), ethyl chloride and ether in two cases, gas and ether followed by chloroform in one case, local novocaine followed by gas and oxygen in one case.

The bacteriology of these cases was not studied.

One of the greatest factors in the etiology of postoperative pneumonia was the operative nightgown. Many of the patients entering a hospital were accustomed to sleep in heavy woolen or flannel underwear; after entering the hospital they were forced to wear light muslin gowns open up the back. Often when the patient

was on the operating table there was only a couple of layers of cotton between the metal operating table and the patient's unprotected back. Hospitals should provide undershirts of different weights, so that the patient used to heavy weights might be property protected until he was well out of the influence of the anesthetic.

THE RELATION BETWEEN CHRONIC MASTITIS AND CARCINOMA OF THE BREAST.

MacCarty and Mensing (*Saint Paul Medical Journal*, May, 1916) note that in the mammary acinus, which is the structural and functional unit of the mammary gland, there are two rows of cells—an inner row composed of cuboidal or columnar cells, the long axes of which are parallel to the radii of the acinus, and an outer row, the cells of which are oval or spheroidal. The latter cells lie between the cuboidal or columnar cells and the connective tissue stroma, with their axes parallel to the circumference of the acinus. The prominence of the outer row varies considerably in different specimens, but it is invariably present in the condition of chronic mastitis.

In chronic mastitis the cells of the inner row are found frequently displaced toward the center of the acinus; they are frequently exfoliated and necrotic. In the presence of such a condition of exfoliation or displacement the cells of the outer row are hypertrophic and often hyperplastic. The cells of the inner row are occasionally absent, and the lumen of the acinus is soon to be filled with hyperplastic cells of the outer row. The latter cells present morphological characteristics which make them indistinguishable from the cells of mammary carcinoma, although they are not present in the stroma.

The line of demarcation between the acinus and stroma is sometimes confused, thereby making it impossible to accurately state whether one is dealing with carcinoma or not.

The presence of two rows of cells, namely, the differentiated inner row and the undifferentiated or partially differentiated outer row, has been termed primary epithelial cytoplasia. The absence of the differentiated cells plus the presence of hyperplastic undifferentiated or partially differentiated cells has been termed secondary epithelial cytoplasia, and this condition, plus the invasion of the stroma by the hyperplastic cells, has been termed tertiary or migratory epithelial cytoplasia. Therefore we have three distinct histologic pictures in chronic mastitis: the first is characteristic of all chronic mastitis, the second is characteristic of some specimens of chronic mastitis, and the third, in its early stages, is associated with the first and second condition. The third condition is the recognized picture of carcinoma, the first is a recognized benign condition, and with our present knowledge the clinical significance of the second condition is still undetermined, although it represents a precancerous histological picture.

Practically one in every five patients with pathologic breasts may be saved from radical operation if the surgeon is accompanied in his work by a competent surgical pathologist.

There are five points to be borne in mind from the facts which have been briefly presented:

Carcinoma of the breast is always associated with chronic mastitis.

The percentage of legitimate error in the clinical diagnosis of simple chronic mastitis and carcinoma is respectively 62.7 per cent and 23.9 per cent.

The percentage of legitimate error in the clinical diagnosis of the condition of the axillary glands is 36.9 per cent.

There are three distinct histological pictures in chronic mastitis. At one extreme there is a benign condition, and at the other extreme there is a malignant condition. The mean, which may be easily recognized, is at present doubtful.

The association of the two conditions is too close to allow a consideration of the one without the consideration of the other.

From a standpoint of advice from the surgical pathologist certain deductions may be drawn from these facts.

The following plan, which suggests itself to the writers after an extensive experience with the pathological conditions to be dealt with, and also an intimate association with the activities of surgeons, seems to be logical.

The condition in the breast which is associated with classical clinical signs of carcinoma should be treated radically.

In doubtful cases in women near or over thirty-five years of age, the entire mammary gland should be removed for immediate examination. If primary or secondary hyperplasia be present, nothing more should be done; if tertiary hyperplasia be present, a radical operation should be performed.

In doubtful patients near or under thirty-five years of age a wide sector of the mammary gland, including the pathological conditions, should be removed for examination. If primary hyperplasia be present, nothing more should be done. If secondary hyperplasia be present, the rest of the mammary gland should be removed, and if tertiary hyperplasia be present the radical operation should be accomplished.

This plan avoids incision of tumors. It removes the possibility of unnecessary radical operations and the consequent physical and psychic embarrassment. It provides for a scientific means of determining more accurately the stage at which cancer may be cured by surgical operations, and the extent of the operation which is necessary to effect such a cure.

HALLUX RIGIDUS.

PAINTER (*Boston Medical and Surgical Journal*, May 18, 1916) notes that hallux rigidus is caused by a hypertrophy of the bone on the dorsum of the distal end of the first metatarsus. He believes it is usually caused by the seam of the shoe which presses continuously against this point while the foot is in action, and this pressure is increased by the "break" in the shoe which necessarily comes next to the point of flexure of the foot. Long before the patients have any idea of a beginning rigidity of their great toe joints, they have often had the skin rub off of the top of these joints by breaking in new shoes. Women are not so subject to this condition because the leather from which their shoes is made is not so heavy, nor do they use their feet as much. Painter has shown there are marked variations in the length of the metatarsal bones, amounting in many cases to as much as three-eighths of an inch. Furthermore, this difference was frequently observed between the two feet of the same individual, thus accounting for the fact that hallux rigidus is very often a unilateral deformity. Sometimes the phalanges showed the variation; rarely was it observed in the bones of the posterior tarsus.

If there are these differences in the lengths of the metatarsals and phalanges in persons who have feet of the total length, breadth and thickness that would make their feet conform to certain sizes of ready-made shoes, it is obvious that the "breaks" in the shoe cannot come at the points where they would come under ordinary circumstances if either the metatarsals or the phalanges have departed to any degree, however slight, from the usual. It is at once apparent that a difference of a quarter-inch in the length of the first metatarsal would make the metatarsophalangeal joint come at a different place in the shoe, and when the shoe has been worn long enough to have the "break" develop in the leather at that point of flexure, it will be seen that it comes close up to the juncture of the vamp with the upper. When this occurs at this place the stock is stiffer because it is near a seam where there are two thicknesses of leather stitched together with a double layer of lining. When the person comes up on his toes under such circumstances there is much more material to be crowded down against the joint, and the effect is multiplied by the number of steps the person takes. The osteoblastic cells in the area thus irritated proliferate, forming a bony overgrowth in this region, which mechanically obstructs the dorsal movement of the phalanx upon the metatarsal, and this in turn keeps the joint in a state of chronic irritability and spasm. Not

being able to bend at the mediotarsal joint in a dorsal direction, this motion must be secured elsewhere, and it is obtained at the first phalangeal articulation of the great toe. The evidence of this is seen in the hypermobility of this joint, and from the fact that the shoe usually shows a small round hole worn immediately beneath this articulation in the sole, for now the pressure in walking is brought under this joint instead of beneath the metatarsophalangeal articulation.

There is generally a ridge on the dorsum of the shoe over the metatarsophalangeal joint, indicating where this articulation is thickened. If the deformity is unilateral, as is frequently the case, a comparison of the two shoes brings out these two points very quickly. It will almost always be noted that this ridge on the dorsum of the metatarsophalangeal articulation comes directly beneath or almost directly beneath the point where the seam marking the juncture of the vamp with the upper lies. It may happen, of course, that the particular pair of shoes the examiner sees on the patient may not show this, but further inquiry and examination may reveal it in other shoes that the patient wears or has previously worn. It is not uncommon for the patient who suffers from this deformity to have a small shoe store in his possession, which represents his attempt to find relief in shoes for the trouble he has. He has often had a good deal of trouble in getting shod, for the reason that a new shoe chafes the dorsal surface of the distal end of the metatarsal, and in breaking in a new shoe the skin is often abraded over this joint.

In the management of this condition several lines of treatment are open for consideration. The conservative treatment consists of custom-made shoes, so constructed as to give no pressure over the metatarsophalangeal joint, together with a plate fashioned after the manner of the ordinary flatfoot support, supplemented by a steel tongue the width of the great toe on its plantar surface and nearly as long as the toe, which projects from the front of the plate, and is, in fact, a part of it. This prevents any attempt at motion in dorsiflexion at the mediotarsal joint, and therefore stops irritation of the cartilage and its consequent proliferation. The use of the plate will be unnecessary after five or six months, and the patient will generally find himself comfortable, and, with custom-made shoes, may expect to get on without further difficulty. This line of treatment is applicable to the earlier cases before dorsiflexion is much restricted.

The more abnormal cases, in which there is no dorsiflexion, possibly require more radical treatment. This means operation. The ridge on the dorsum of the metatarsal is chiseled away or a regular Hüter operation is performed. In cases in which there is ground to suspect any osteoarthritic diathesis the latter is preferable. An English orthopedic surgeon has excised the sesamoids beneath this joint for the relief of these symptoms with very gratifying results, it is stated, but just what surgical indications is met by such a procedure it is difficult to see.

MALUNITED AND UNUNITED FRACTURES.

JONES (*British Medical Journal*, June 10, 1916) observes that the conditions to which the terms "delayed union" and "non-union" are applied may be difficult to distinguish because often we find that, even after months, osteogenetic changes leading to consolidation will take place in a fracture considered to be permanently ununited. The article contains so much of value that we think it wise to publish it almost entire.

For various reasons, some of which are still unknown, a certain proportion of fractures take longer to unite than others. There may be several weeks of apparent inactivity in callus formation, and then consolidation occurs quite rapidly. If a practictitioner takes care to maintain a good length and accurate alignment, he should look forward cheerfully to a happy issue even if union is delayed. As a rule, this is exactly what he does not do. At the end of the fifth week he begins to feel nervous, he disturbs the bone ends, modi-

fies his methods, and by degrees transforms into a permanent disability a condition which merely demanded patience.

Delayed union is most common in the middle of the femur, in the humerus at the junction of the middle and upper third, and in the tibia and fibula at their lower third.

In many cases there is an obvious reason for the delayed union. Very often it is not due to malposition; it is, indeed, quite remarkable how often in delayed and ununited fractures the bones are almost automatically opposed.

An obvious and frequent cause is inefficient reduction. Another cause of delayed union is circular compression of the limb by splint and bandage.

A fundamental principle in the treatment of fractures is to secure and maintain good length and good alignment, and in attaining these ends care should be taken that the circulation of the limb shall be in no way hampered. The splint used should be so constructed that after the bandage is applied the fingers can be readily introduced between it and the lateral aspect of the limb. It is because plaster generally fails to secure length and adequate blood supply that it is a prolific source of delayed union and ununited fracture.

Fractured adult bones are never firm after four or five weeks, as text-books would lead us to infer.

In the case of the lower limb, where the effect of body weight has to be considered, to underestimate the period of consolidation is to invite disaster.

If a case of delayed union is first seen in the seventh or eighth week we need do no more than make quite sure of good alignment, length, and circulation. Nature will do the rest.

If a long time has elapsed the need for action is more pressing, and we must endeavor to transform the indolent callus into an osteogenetic factory, so that bone may be generated. Jones advocates the method suggested by H. O. Thomas, and named by him "percussion and damming."

As an example he cites a case of non-union of the femur with shortening, probably of two or three inches. Under an anesthetic the soft fibrous callus was broken down and the fractured ends were turned toward the skin and beaten with a mallet; a pulley was then applied to the limb, and as much length as possible gained. A Thomas knee splint was then adjusted and the extension maintained. Two pieces of India-rubber tubing were tied around the limb, one three or four inches above the fracture, and the other at an equal distance below. They were kept on, to begin with, for about twenty minutes each day until they could be borne for several hours at a time. They were kept tied sufficiently tight to produce considerable swelling and stasis. In two or three weeks callus was thrown out, and the osteoblasts began actively to produce bone. Local congestion between two india-rubber tubes is much more effective than congestion by one proximal tube. Jones recalls many cases in which bones that had remained ununited for several months became firmly consolidated after use of this simple devcie (invented by Thomas and described twenty years later to Bier) for stimulating osteogenesis.

In old ununited fractures of the tibia and fibula complete extension is not so easily attained, and it may be necessary to remove bone. If this be done, the operation should be performed under pulley extension, or by turning the ends of the bone out of the wound and engaging the fragments in shoehorn fashion after the method of Lane. If the case be suitable and the surgeons possess the mechanical skill subsequently to keep a good alignment, it is best to avoid the introduction of plates or screws. The bones should be kept in absolutely good apposition, and where it can be easily accomplished they should be wrapped in transplanted fascia, which will act as a binding membrane in the same way as a periosteum.

In another type of case in which the bone is eburnated with feeble callus production, it is well after sawing the ends to crenate the edges with bone nibblers, and to trans-

plant bone from some other part of the body. The sides of the fractured ends should be prepared to receive the transplanted portion, which can be affixed laterally, or driven into each end of the medulla. The transplanted bones and the fractured ends are held in position with transplanted fascia wrapped around them.

Autogenous transplantation of bone is far more effective than transplantation from another patient or from an animal. A bone graft without periosteum is sometimes as effective as one taken with periosteum. This fact is important, for if bone is removed from some other part of the body subperiosteally, the removed bone is very rapidly replaced by new bone. Where convenient, however, the periosteum should be retained.

Non-union is very apt to occur where a wide gap exists between the bones, as in the case of fracture of the tibia of long standing, where the growth of the fibula has progressed.

Malunion of the femur of six or seven weeks' duration can almost always be corrected by powerful manipulation. The same is true of all the long bones. At his clinic every week the author is accustomed, by wrench or hand, to correct malunited fractures of several weeks' standing. The method is especially applicable to a Colles's or a Pott's fracture.

Weak union can be diagnosed almost with certainty even when ordinary manipulation fails to detect it. It is suggested by tenderness on pressure over the site of the old fracture, and confirmed by the additional sign of exuberant callus exudation. A malunited fracture of some months' duration, if accompanied by these two signs, can usually be corrected by forcible manipulation. This is a very important clinical fact to remember from the point of view of immediate or gradual correction.

Exuberant callus is sometimes so abundant as to be mistaken for malignant disease, and the author has met with many instances in which the patient has narrowly escaped amputation. This error is more likely to occur in the femur than in any other of the long bones, especially when the force applied to produce it has been so slight as to suggest that the fracture was spontaneous.

Malunion of a fracture can always be prevented and should raise a strong presumption of inefficient treatment.

The causes of malunion may be found (1) in errors in the initial treatment or setting of the fracture, (2) in errors in the method of maintaining the fracture in position, or (3) in errors of after-treatment.

Malunion of a fractured bone is due to imperfect setting more often than is commonly supposed. Sometimes it is due to want of knowledge, but more often to want of experience and confidence.

Common causes of inefficient reduction are:

(*a*) Insufficient extension of the limb in fractures of long bones—such as the femur or humerus—so that the overriding of the fragments is not completely corrected.

(*b*) In Pott's fracture there is always an associated dislocation of the ankle outward and backward. If the backward dislocation is not fully corrected there is pain over the front of the ankle when the patient walks, and, in addition, inability to dorsiflex the ankle, which causes a serious impairment of function.

In Colles's fracture the backward displacement of the lower fragment is very serious, and is not always corrected by the orthodox traditional "hand-shaking" method of reduction. The lower fragment carries with it the articular surface for the head of the ulna, and if this is out of line the upper and lower articulations between the radius and ulna are thrown "out of true" and the radius will not rotate properly. This leads to impairment of pronation and supination, and consequent very serious interference with function.

These are merely instances of how a want of sufficient determination in reducing the initial deformity may play an important part in causing subsequent loss of function. The author says he refers to them because he sees a large number of cases of serious

impairment of function really due to these causes.

If the fixation of the limb after the fracture has been reduced is inefficient so that material amount of movement can take place between the fragments, then every such movement causes pain, and produces a reflex contraction of the muscles. This reflex spasm may very readily cause overriding of the fragments, and in the case of the shafts of long bones lead to shortening. In fracture of the neck of the femur it modifies the angle between the neck and the shaft and so causes the flexion of the joint, with the result that body weight is not transmitted in the normal line. In consequence of this, crippling changes of an osteoarthritic character subsequently occur in the joint. Faulty alignment of the bones may arise from inefficient fixation, even in a case in which the fracture was originally fully reduced and the bones brought into correct alignment. The result is that the true line of the shaft of the bone is not maintained and the joint at one end of the bone is thrown out of its proper relation to the joint at the other; in consequence, muscles do not act in their correct line, and the usefulness of the limb is impaired. Further, in the lower limb the line of transmission of body weight is altered, and this throws an improper strain on joints and ligaments, resulting in changes in the joints, in flatfoot, and in other disabling deformities. For instance, in fracture of the tibia and fibula a little shortening of the limb does not seriously impair its strength if the alignment is good. A slight bow-leg even is not serious, for slight bow-leg is a harmless type. Many muscular and powerful men are, indeed, slightly bow-legged, but in a valgoid deformity the weight of the body is carried too far to the inner side of the foot, and this throws too much weight on the arch, and the result is a flat and everted foot.

Any valgus deformity at the knee, in the leg, or at the ankle is a weakening deformity, and greatly reduces the usefulness of the limb. It is a good fault, therefore, to err on the side of producing a slight bow-leg, with its varoid accompaniment, if there is to be any error at all. In cases of malunion, when the callus is still tender, it is generally not difficult to readjust the limb by manipulation without having to perform an open operation. In the case of the femur, this can usually be done two or even three months after the original fracture. As a rule, the worse the position of the bones the longer will the callus take to consolidate.

Callus may yield in such a way as to throw the bone out of proper alignment. A good example of this is frequently afforded by cases of Pott's fracture which have been correctly reduced, and six weeks later are in good position and united. A month after this, however, the patient may complain of some pain at the site of the fracture and also of symptoms of flatfoot.

Here the counter-pressure of the ground on the foot forces the astragalus against the external malleolus, and so produces a lever action, straining the callus. To avoid this, every case of Pott's fracture should be set to work with the inner side of the heel raised to keep the foot inverted, and if the patient is a heavy subject an outside brace also should be worn. It is disconcerting and puzzling to see a perfectly good functional result replaced by a bad one; to avoid disappointment of this kind it is advisable, particularly in fracture of the lower limb, to apply some sort of guard to prevent straining of the callus.

Fractures of the humerus near the shoulder-joint (that is, those of the surgical neck and above the insertion of the deltoid) are commonly associated with inability to abduct the limb fully. The reason is that the upper fragment is often tilted outward, and end to end union does not take place. In order to avoid this, the surgeon's object when setting the fracture should be to bring the fragments end to end if possible. He should pull the arm at right angles to the trunk, or even straight upward, until all overriding is completely overcome, and should then endeavor to engage the end of the lower fragment on the broken end of the upper fragment. By

pressing the two together he can at once tell if they are engaged or are sliding past each other. If they are engaged, the arm can be gently brought down to the side and secured to the trunk by bandages. Once the fragments are engaged they are not likely to become disengaged again.

In fractures about the elbow-joint, with the single exception of fracture of the olecranon process, the usual disability is limitation of flexion.

The limb should therefore be extended to push away any fragment likely to obstruct extension afterward. The forearm should be supinated to make sure of clearing a right of way in that direction, and then the elbow should be fully flexed and bandaged, care being taken not to produce tight circular constriction of the limb in any part. In this way we may make sure that there shall be no callus exudate in the bend of the elbow, and at the same time the tendon of the triceps acts as a posterior splint.

When a stiff elbow, after an injury, has to be dealt with, the same maneuvers are gone through so as to force the recently formed callus out of the way until full flexion is secured. Usually this can be done on one occasion, but in some cases it may be necessary to flex the joint in two or three stages.

In fractures of the bones of the forearm the disability most to be feared is obstruction to supination; pronation is naturally good. Therefore, in setting the fracture, or when breaking down callus and resetting the fracture, the surgeon should extend the forearm and supinate fully in order to make sure of a clear right of way for supination, and then set the fracture, taking care that the ulna is perfectly straight, and that there is no lateral pressure anywhere on the shaft of the radius. It must, however, be remembered that the radius is a curved bone which rotates on the ulna like the handle of a bucket; if the arched shape of the radius is destroyed the joints at its ends will be out of their true line, and impairment of function will be the result.

Fractures of the carpus often result in a stiff wrist in a flexed position. Every schoolboy knows that the grasp of the hand is weakest when the wrist is flexed. Therefore, in every case of fracture or injury of the carpus, the wrist should be put up in a hyperextended position.

If the wrist has been allowed to get stiff in a flexed position, it should be dorsiflexed under an anesthetic and fixed in that position. In rare instances a fragment of the scaphoid is displaced on to the dorsum and blocks extension; if this has occurred, it may be necessary to remove the fragment before the wrist can be hyperextended.

From fractures near the ankle-joint many patients complain of both pain and stiffness which lasts for months or years. There are two principal factors responsible for loss of function here. Eversion of the foot, for instance, is fairly well recognized as one of them. If the patient is allowed to recover with the ankle in a valgus position, the body weight when he stands will fall too far to the inner side of the foot, and at once all the factors which make for flatfoot are produced. It is, however, not sufficiently well recognized that these conditions may be at work in an ankle which has every appearance of being in good position when the patient is discharged from hospital. Straining of young callus by body weight is common in fractures around the ankle-joint, owing to the patient being allowed to walk on the unprotected joint too early. Therefore these patients should all be turned out with "crooked" heels and often with an outside brace as well, to insure that the body weight shall fall on the outer side of the foot. The natural corollary of this is that if body weight will produce a valgus deformity by straining the callus, it will also correct it if we "crook" the boot well, and therefore when the callus is already strained in the valgus direction, and the patient comes with a stiff painful ankle and foot, all we need to do in many of the milder cases is to crook the boot well on the inner side, and let the patient "walk out" his deformity. In older and more severe cases it is

from the first necessary or advisable to wrench the foot into an inverted position under an anesthetic, and then let him walk with his feet crooked; this is made easier by the application of an outside brace. If this after-treatment is not persisted in for some weeks the condition will most likely recur.

The second great disability, after injuries about the ankle-joint, is inability to dorsiflex the ankle. The patient, when walking, cannot get forward on to the toes and fore part of the toes without pain across the front of the ankle.

This is a very difficult condition to correct once the deformity has been allowed to become established. The proper thing is to prevent it when the injury is recent; to make sure of this the surgeon should dorsiflex the foot and so satisfy himself that he has commanded a complete and clear right of way for this movement in the future.

Both these disabilities are well illustrated by cases of Pott's fracture; this injury essentially consists of a fracture of the fibula about three or four inches above the external malleolus with a dislocation of the ankle outward and backward. There may be minor complications, such as fracture of the tip of the internal malleolus or the less well-recognized fracture of the edge of the articular surface of the tibia. These, however, do not alter the general nature of the disability.

The method of reduction adopted is the following: The knee is flexed to relax the calf muscles. If these muscles give trouble, tenotomy of the Achilles tendon will put them out of action, but this is only necessary in exceptional cases, and strength returns but slowly after this apparently harmless operation. Grasping the foot by the heel in one hand and the dorsum in the other, the foot is pulled and everted to make sure of thoroughly disentangling the fractured ends. While still pulling, the foot is fully inverted and the ankle dorsiflexed. If the ankle cannot be dorsiflexed fully, it means that there is a definite posterior dislocation or that the anterior edge of the tibia is fractured. It is necessary then to push the tibia back and bring the foot well forward until the ankle can be well dorsified. The foot is then fixed in splints in the fully inverted position and dorsiflexed a little beyond the right angle. If the surgeon maintains it in this position, he may wait with confidence for a good result. If he is content with a less thorough reposition, he is in great danger of getting a result with some stiffness, pain, or limitation of movement, which will seriously interfere with comfort in walking. Since the days of Percival Pott many splints have been devised. The shape and style of the splint does not matter a jot. The important element is the surgeon. If he knows his work, he will fix the foot in the position described and will be rewarded by a good result.

Malunion and consequent functional disability depend on two factors: (*a*) eversion, (*b*) diminished dorsiflexion.

Eversion often calls for operation. In comparatively simple cases all that is needed is to pass a chisel through the internal malleolus, and also through the site of the old fibular fracture. The foot should then be forcibly inverted, and treatment continued to maintain the inversion.

In the more severe type of case an open operation is advisable. A wedge of bone is removed from the lower end and inner side of the tibia. The wedge should only go a distance of four-fifths through the bone. An osteotomy of the fibula is next performed. The wounds are closed, and not dressed for twelve or fourteen days. The stitches are then removed, and, under gas, the limb is fractured by forcible inversion. This two-stage operation eliminates the anxiety which must attend the treatment of a compound fracture, and is an important matter when powerful manipulation is necessary. For many reasons, however, it may be advisable to complete the reduction at the time of operation.

Dorsiflexion of the ankle may be blocked by callus exudate, the result of fracture of the anterior articular edge of the tibia. Complete dorsiflexion of the ankle at the

time of accident would save the patient from this deformity, for the fragment of bone would in this way be pushed to one side; but if this has not been done, and at a later date we find that dorsiflexion is prevented, an incision should be made and the offending prominence chiseled away. The space left by the removal of bone should be packed with fat removed from any convenient part. This prevents the new callus exudate from giving rise to trouble. In all operations where bone is removed and pseudoarthrosis is desired the generous employment of fat is most helpful. In order to reduce the callus exudation the exposed cancellous bone should be lightly hammered.

In fracture of the tibia faulty alignment may be brought about by posterior bowing; the weight of the body may be thrown so far back that it passes at some distance behind the ankle.

Fractures of the neck of the femur, and all fractures about the small trochanter, should be treated in the abducted position to prevent deformity of the coxa vara type. Stiffness of the hip associated with limitation of abduction, often accompanied by "osteoarthritic" changes in the hip-joint, is the sequel of malunion in this region. To prevent this it is necessary to secure abduction and to maintain extension in the abducted position. If the fracture is of some weeks' standing and the area is still tender, the callus is certainly not consolidated; forcible abduction and extension in an abduction frame and rigid fixation in this position will then be followed by adaptation of the callus to the corrected position.

Fractures of the shaft of the femur, especially in the middle third, are frequently followed by gross forms of malunion, which will excellently serve to illustrate malunion in long bones.

The faults commonly are: Shortening or overriding, due to the fact that (*a*) reduction has been incomplete, the surgeon not having pulled until the fractured limb was at least as long as its fellow; (*b*) the method of fixation and extension used has been inefficient and the muscles have caused overriding after the fracture was set; (*c*) the body weight has caused yielding of the callus after the patient has begun to walk.

Angular deformity or erroneous alignment is the result of inefficient methods of fixation, and more particularly of inefficient extension in the line of the limb. Erroneous alignment throws all the muscles of the part out of line, and, what is more important, puts the joints above and below out of their correct relations. A common fault in fractures at the junction of the lower and middle third is a posterior sagging, which is best seen when the patient begins to walk. The body weight is thus thrown on the posterior part of the capsule. The deformity resembles a genurecurvatum.

Rotation deformity is far too common, and can only be the result of careless and inefficient treatment.

In case of malunion of the shaft of the femur in which one or more of these elements are present, the whole region of the fracture is tender, and is also the seat of pain for weeks and months after consolidation ought to be complete. This means that consolidation is far from complete, and that the callus is the seat of active change. Nature, in fact, is struggling with the problem of buttressing up the malunited fragments so that they can meet the forces which are acting in them, hence the exuberant production of callus, which is attended by pain and tenderness.

In such cases it is not difficult to break down the callus by manipulation. Extension with block pulley and suitable tackle will then stretch the muscles and reduce the overriding by 2½ inches on a single occasion. Rotation deformity is, of course, corrected at the same time.

If open operation is employed, the simplest form of osteotomy is an oblique one through the callus between the original fragments of the shaft. Once these are cut through the greatest part of the remaining difficulty is in fully restoring the length of the limb by extension. The big muscles of the thigh can only be fully overpowered

by the use of block pulley and tackle. When this has been accomplished the leg is fixed in a Thomas knee splint, the tuber ischii rests on the padded ring, the extension straps are secured to the bottom of the splint. We are then sure that, whatever happens, the muscles cannot contract and cause further overriding. The only thing the muscles can do is to give up the struggle, and, as a matter of experience, this is what always happens.

The surgeon finds on his next visit that he can get perhaps another half-inch of lengthening by further extension on the straps. Further, in a Thomas knee splint good general alignment of the limb can easily be secured—in fact, is obtained almost automatically. The only points to which the surgeon has really to attend are the position of the foot—to see that there is no outward rotation—and to keep up firm extension.

Locally, splints are applied to control lateral movement. In the first instance this is not difficult. When resetting a malunited fracture it is not so easy, for the callus already formed gets in the way.

In these malunited fractures of the femur of some weeks' standing with considerable overlapping, after refracturing the bone by force the pulleys should always be applied and a great effort made to secure both length and alignment. To render this less difficult, it may be wise to move the fractured ends freely in all directions to disturb and disengage the fibrous and bony exudate. The extension by pulley should be maintained for several minutes to lessen the resiliency of structure and to reduce the chance of telescoping. The limb is then maintained in extension by a Thomas splint, and on two or three subsequent occasions the pulleys are applied. By these simple means overlapping of three or four inches can be overcome, and an open operation is avoided. The "damming" method already described is applied to assist osteogenesis, aided when necessary by percussion.

Whatever operation may subsequently be needed, the necessity of preliminary pulley traction cannot be too strongly urged, in order to secure a better length, and in this way prevent the sacrifice of bone.

In cases in which union in the vicious position is so complete and firm as to render operative procedures necessary, the procedure to be followed is influenced by the special type of union present. If it is a mere case of faulty alignment, with fair apposition, a small puncture and an osteotomy saw will do what is desired. An *x*-ray photograph should be taken, and the section made through the angle. The case is then treated as one of simple fracture. If there is overlapping of the fragments, with no excessive callus, the saw is introduced between the fragments and the lateral fixation undone. Pulley extension will then diminish or obliterate the shortening, and the subsequent treatment will maintain both length and alignment. In other fractures higher up, with great thickening and lateral deflection, a wedge is removed from the convex side of the bent bone, and a fracture at the point preferred may be produced some days later. Extension and abduction of the limb should then be secured. In rarer instances, when unusual deformity and overlapping have occurred, it may be necessary to explore the fracture by a free exposure, to separate the fragments, to remove bone, and to plate.

THE TREATMENT OF GUNSHOT WOUNDS BY PACKING WITH SALT SACS.

HULL (*Lancet*, May 27, 1916) says that the treatment of septic wounds by a pack which is allowed to remain in the wound for several days is so opposed to the usual teachings of surgery that at first sight its utility may be doubted. Nevertheless, such treatment has proved one of the most effective methods of dealing with septic wounds during the present war. It has also been found to be one of the most generally applicable procedures for the treatment of secondary hemorrhage. It possesses the great advantage of simplicity, an important factor when large numbers of cases require

the attention of a limited staff. It also allows transport to be undertaken without any anxiety regarding the dressing of the wound.

When it is necessary to drain a wound cavity, three methods could be considered.

The ideal method would be to expose the whole of the interior of the wound. There are anatomical and surgical objections to this as a rule, but it is occasionally employed: for example, when a rectal fistula is slit up, when an amputation is performed by the guillotine method, and in certain cases of excision of wounds. Very inferior to this ideal method is the drainage of every pocket and cavity of a wound. The interior of the wound is often very irregular, and it is sometimes impossible to insure that every pocket is drained. The third method, treatment by salt, imitates the first or open method, by draining every portion of the wound surface.

The treatment of septic wounds must fulfil certain requirements. The infecting microbes must be removed by some form of lavage. The outflow of lymph must be increased. The bacterial growth must be repressed and the coagulation of the discharge must be prevented. The tissues of the wound must not be damaged either by chemical or mechanical measures. These requirements may be met by the use of hypertonic solution of common salt.

It can be demonstrated experimentally that the higher the concentration of salt the greater will be its power of attracting water and albuminous substances. The "drawing" power of salt has been known for many years. Sir A. E. Wright's original lymphagogic solution consisted of 5 per cent common salt with 0.5 per cent sodium citrate, used for lavage and repression of the bacterial organisms of septic wounds. Lawson placed tablets of compressed salt in the lumina of drainage-tubes. Col. Gray used solid salt in the form of tablets, which wrapped in gauze formed a strong salt solution.

Packing wounds with gauze impregnated with concentrated salt solution must not be confused with the plugging of wounds with ordinary dressings. Wound cavities are only potential spaces, and in order to drain them the walls must be kept apart. Ordinary drainage-tubes rarely drain every recess, and elaborate methods are required to obtain drainage from every portion of the walls and avoid the shutting off of pockets. A wound cavity filled with gauze and salt may be considered as effectively drained as if the cavity were inverted and the walls dressed as a surface wound. Every portion of the surface area is drained by the osmotic action of the salt, and the capillary action of the gauze and bandage is continually removing the discharge and producing an automatic drainage and lavage of every portion of the interior of the wound.

The tablets of salt must not come in contact with the tissue or sloughing will often ensue. The wall of the cavity must be well protected by gauze. The solid salt sac is an improvement upon the tablets. It consists of a two-walled sac of suitable size made of bandage, between the layers of which four layers of gauze are placed. The interior of the sac is filled with salt and the tail of the bandage forms a drain.

The sac is made by laying a strip of open woven bandage about a foot in length flat on the table. On this strip four layers of gauze are placed the same width as the bandage, but about 4 inches in length. On top of the gauze another strip of bandage is placed. The sides of the bandage strips are then brought together by doubling the bandage in its long diameter and sewing to form a sac. The sac is filled with salt; a few stitches are put in to close the mouth. These sacs are made in several sizes, sterilized in an autoclave, and stored ready for use. One or more of them are used to pack the wound, the intervals between the sacs being filled with gauze. A tube of perforated zinc or rubber may be passed into the depth of a large septic cavity. Long slender sacs are made to fill bullet tracks. Small sacs are made for draining tracks in the brain. The free end of the sac is passed into a vessel containing saline solution, and the wound then drains by capil-

lary attraction. A fine rubber tube may be run in along each sac, and drip irrigation may be carried out if required. The salt remains undissolved for several days, and when the sacs are removed from a wound at the end of a week undissolved salt still remains.

There are two ways of dressing a wound so that no harm is done by the changing of dressing: one is to keep a light dressing continually moist so that its removal is not felt by the patient and no tissue is damaged; the other is to leave the dressing until it is quite moist and can be removed without pain. The dressing of deep wounds is too often merely a ritual; the dressings and drainage-tubes are removed and replaced by clean ones, but the complicated series of recesses which make up the interior of most wounds cannot be reached. They may be reached by irrigation, but some portion of the wound will escape the distending effect of a drainage-tube, and the walls will fall together and a pocket will result.

The effect of the salt sac is to form a concentrated solution of salt which promotes the resolution of inflammatory induration and aids the separation of dead tissue by solution of coagulated lymph. A powerful outgoing stream of healthy lymph is produced which carries microbes and débris out of the wound and retards the bacterial growth within it. It is unnecessary and undesirable to continue the action of this hypertonic solution of salt once the wound becomes clean. If the wound is clean the sacs are removed, usually in from five to ten days, and treatment by normal saline instituted. If the wound is foul it is either again packed with salt sacs or dressed every forty-eight hours with gauze soaked with 20-per-cent salt solution. When the patient's temperature remains high and his general condition is unsatisfactory, it is fair to assume that a streptococcus is present. The presence of healthy lymph induced by the salt sacs does not aid in dealing with the streptococcus, but it appears probable that the most effective defense the body possesses against this organism is the white blood-corpuscles. When normal saline is used the wound, hitherto bright-red, becomes covered with a gray film. This is caused by the protective layer of leucocytes which act as a barrier against further invasion until the healing is completed by the ingrowth of epithelium. The hypertonic solution is therefore changed to normal saline when streptococcal infection appears probable.

The advantages of a dressing which does not require attention for seven or eight days will be obvious. The patient is saved the pain and inconvenience of frequent dressing, there is a diminished risk of secondary infection, and there is an enormous saving in material. The salt sacs have been found useful in many special instances.

A method of treatment which saves the patient the pain and inconvenience of frequent dressing, which forms an efficient method of preventing hemorrhage, and saves an enormous amount of labor and material, is a good method provided its results are equal in all respects to other methods of treatment. The author believes that the results are not only equal to but better than any other known method, provided the technique is properly carried out. It appears rational to add an antiseptic to the salt in foul cases, and eupad appears to be the most useful. Its addition certainly appears to do no harm, and offensive odors are in a great measure obviated by its use. Sacs filled with eupad and salt in the proportion of one to three are destroyed in the autoclave owing to the corrosive action of the hypochlorous acid upon the fabric. A convenient method of combining the eupad with salt is to pack the wound with ordinary salt sacs sterilized in the autoclave and introduce into the middle of the sacs, without touching the wound, an unsterilized sac filled with eupad.

Six days may be said to be an average time for the sacs to remain in the wound. The temperature usually falls to normal within that period. A rise of temperature is apt to follow the dressing; this rise can usually be avoided by irrigating the wound for some hours before removing the salt sacs.

The successful results of this treatment largely depend, as all treatment of septic wounds must, upon an early campaign against the sepsis and upon the thoroughness with which it is possible to remove septic and necrosed tissue.

THE INFECTIOUSNESS OF THE CEREBROSPINAL FLUID IN SYPHILIS.

FRUEHWALD and ZALOZIECKI (*Berl. klin. Wchnschr.*, 1916, 53, 8) point out that the pathology of syphilis of the central nervous system has been advanced a great deal through studies on the cerebrospinal fluid. After it was discovered that the treponema pallidum is the cause of syphilis, it was looked for by numerous investigators in the cerebrospinal fluid, and found generally by microscopic methods and particularly through animal inoculations. The authors' work on this subject was interrupted by the onset of the war, but they had advanced far enough to secure some definite positive results, which were as follows: (*a*) No positive results were obtained in cases of tabes or general paresis. (*b*) Positive results by inoculation methods were obtained in an early secondary case with manifest central nervous system symptoms, and in two others, late cases of secondary lues, in one of which the spinal fluid was entirely normal, and in the other there was a positive Wassermann reaction. The authors were unable to arrive at any rule by which one might judge the infectiousness of the cerebrospinal fluid in any stage of syphilis.

An analysis of the literature on the subject to date reveals the following facts:

(*A*) Acquired lues. (1) Without nervous manifestations: (*a*) primary lues up to the eighth week, negative; (*b*) primary and secondary lues eighth to tenth week, 2 positive cases; (*c*) late secondary lues, third to twelfth month, 5 positive cases; (*d*) tertiary lues, negative. (2) With nervous symptoms: (*a*) early luetic meningitis, 1 positive case; (*b*) "neurotetrecidiv," 1 positive case; (*c*) luetic apoplexy and hemiplegia, 2 positive cases; (*d*) late luetic meningitis, 1 positive case; (*e*) tabes dorsalis, 2 positive cases; (*f*) paresis, 5 positive cases.

(*B*) Congenital lues: (*a*) early cases, 2 positive; (*b*) late cases, 2 positive.

It will be seen from this analysis that the greatest number of positive results occur in the late secondary stage and that a relatively large number of positive findings are obtained in the later syphilitic involvements of the central nervous system. All told, however, the causative agent is found quite infrequently. Spinal fluids containing the treponema may be entirely normal otherwise, in association with a positive or negative blood Wassermann reaction and in the complete absence of nervous manifestations.—*American Journal of the Medical Sciences*, May, 1916.

LOCAL SPINAL ANESTHESIA.

GADGIL (*Lancet*, June 3, 1916), basing his opinion upon an experience of 500 cases, summarizes the reasons for non-success in the use of spinal anesthesia as follows:

Difficulty in entering the spinal canal. This may be due either to nervousness on the part of operators or on that of their patients, whose confidence they have failed to win and who consequently do not keep steady at the time they feel the prick of the needle.

The position in which the patient is placed at the time of the introduction of the needle. There are two positions in which the needle may be introduced. In the first the patient is required to bend forward while sitting at the end of a table; in the second he lies on one side, always, of course, in fully bent position. It is more difficult to introduce the needle into the spinal canal when the patient lies in this second position; the first is the more convenient.

The position after the anesthetic is introduced. It should be with the patient's back propped up, not too high from the horizontal.

The amount of stovaine injected. It is generally not sufficient.

The fear of collapse. This unnerves the surgeon, because he is aware that the patient is watching his actions with anxiety.

The author's suggestions to counteract these defects are:

Do not be disappointed if you do not get into the spinal canal at the first attempt; difficulty in this matter is more common than is generally acknowledged.

For the novice the position of sitting stooped is best. (*a*) Always see that the lumbar spines are quite prominent before introducing the needle. (*b*) Puncture at the upper margin of any of the lumbar vertebræ from the second to the fourth. (*c*) Keep the point of the needle absolutely in the middle line and the whole needle perpendicular to the skin. (*d*) Do not follow the text-book advice, which is to insert the needle a little away from the middle line a little upwards and inwards, as thus the canal is often missed.

The author always gives a full ampoule of the stovaine and glucose solution, which is equivalent to a grain of stovaine, in all adult cases. He has never had any bad effects which he could attribute to a big dose. This full dose does away with the necessity of shaking gently the patient, of making him sit and lie down a dozen times for diffusion of the drug.

In some cases when operating only on one side of the body it is desirable to introduce the drug when the patient is lying on the side to be operated upon. He makes this statement more explicit. If for instance the left knee is to be cut, with the patient stooping forward, the needle is introduced into the canal; the patient is then placed on his left side and the drug is injected. He lies in that position for a minute or two, and is then turned on his back for operation.

The author has never used this anesthetic for any operation above the level of the umbilicus. It takes about ten minutes for anesthesia to spread from the trochanters to the umbilicus, while for rectal operations the effect is immediate.

It is unnecessary to test the sensation before starting operation; though protopathic sensibility is lost, epicritic sensation remains for a longer time, and the patient says he feels pain when he is only feeling a light touch.

When operating on abdominal cases or on any very nervous individual, a hypodermic injection of morphine gr. ¼, atropine gr. 1/100, and hyoscine gr. 1/100 is given three-quarters of an hour before operation. The patient generally remains asleep during the whole course of the operation.

The back rest should be kept about 30 degrees from the horizontal. This height is quite sufficient. The anesthetic does not diffuse rapidly.

When a patient collapses, as evidenced by pallor, nausea, vomiting, and cold perspiration, Gadgil advises the surgeon to remain calm; inject strychnine; raise both legs up in the air, trying to meet the head, as used to be done in order to stretch the sciatic nerves in the old-fashioned way without an operation; and put with the forearms great pressure over the abdomen for five minutes or more. Generally the operation may then be continued within ten minutes.

Headache is the only after-result.

THE APERIOSTEAL STUMP AND ITS CARE.

LYLE (*Annals of Surgery*, June, 1916) points out that the aperiosteal method of amputation aims to produce a painless supporting stump capable of early functional use. The essential points of the technique consist in removing a small cuff of periosteum from the bone stump and spooning out the marrow cavity for a like distance, plus the after-medicomechanical treatment of the stump.

A small cuff of periosteum, 0.5 cm. in depth, is removed, and the removal is carried out in such a manner that no shreds of periosteum remain. Such shreds retaining their primitive osteogenetic function are capable of producing painful bony spikes, which would interfere with the early functional use of the stump.

An illustration of the result of incorrect technique is given. In this case instead of

sawing through the bone the operator raised a cuff of periosteum, then sawed through the bone and cut away the periosteal cuff. In other words, there was an unnecessary stripping of the periosteum, with the resultant formation of numerous osteophytes. In a picture showing an ideal bone end the bone and periosteum were divided together and the periosteal cuff carefully removed from above downward, the marrow being scraped for a corresponding distance. More than 1 cm. should never be removed on account of the possibility of bone necrosis.

The best formed stump if not quickly put to use as a real support may become atrophied and useless. It is this special feature of the aperiosteal method that should be emphasized. The patient is put to bed with the leg elevated. As soon as the wound is healed begin Hirsch's medico-mechanical treatment. Massage the stump twice daily, and after each treatment rub in a 2-per-cent solution of salicylic acid in olive oil. At night bathe in a warm sodium carbonate solution. Protect the stump with lamb's-wool. Place a box at the foot of the bed and have the patient press the stump against it for from five to ten minutes three times a day; then four times; finally every hour. After each treatment energetically flex and extend the hip and knees. Now begin standing exercises. Rest the stump on a bran-bag or a cane-seated chair, at first placing the weight evenly on both legs; later place all the weight on the stump. At the end of two weeks the patient should be able to wear a peg-leg, later a permanent prosthetic appliance, which directly receives the weight through the end of the stump.

If a surgeon decides to perform an aperiosteal or any other type of amputation he has no moral right to undertake it if he is not willing to carry out an after-treatment which aims to provide a painless end-bearing stump. To allow a maimed man to go through life with an ever-present painful stump is a heavy responsibility. Except we have come in contact with a large number of these sufferers we can scarcely realize what the problem means. One thing the author is sure of: they have a very poor opinion of surgeons and surgery. We must ask ourselves if this estimate is just. Considered in the light of past standards it is not; considered in the light of the higher standard set by Bier it is.

An early functional use of the stump is the best method of preventing atrophy. This is in direct opposition to the accepted teachings of this country. The majority of patients are turned over to the artificial limb-maker, who institutes a course of stump shrinking, which lasts from three to six months, until a permanent atrophy of the stump is obtained. The atrophied stump is then considered ready for a permanent prosthetic appliance. Unfortunately, these appliances are designed to aid and abet the vicious atrophy-producing theory. The whole treatment is an attempt to make a part strong by using every known physiological and mechanical means to make it weaker.

PENETRATING WOUNDS OF THE ABDOMEN.

FRASER and BATES (*Journal of the Royal Army Medical Corps*, June, 1916) are convinced that in the vast majority of cases of penetrating wounds of the abdomen operative measures offer the best chance of success. They qualify their statement by excluding from this category uncomplicated wounds of the liver and certain wounds of the kidney. When the wound affects the hollow viscera of the abdomen, it is only as the rarest exception that a spontaneous recovery occurs.

When these cases arrive in hospital they are almost universally in a state of intense collapse. It is therefore advisable to wait for a period of from one to two hours until the increased shock of the journey has subsided.

To this rule they make one exception—those cases which show evidences of rapid and progressive hemorrhage; in such cases

the risks attendant on immediate operation are taken.

During the interval of waiting it is difficult to decide whether or not active stimulant measures should be adopted. These cases are generally complicated by some degree of hemorrhage, and stimulant measures in all probability tend to increase the bleeding; the preoperative stimulation is limited to getting the patient thoroughly warm and administering one cubic centimeter of pituitary extract.

During the operation every precaution is taken to minimize the degree of shock; the theater is thoroughly heated; the table is provided with a hot-water bed; it is advantageous to operate on these cases while they are in the Trendelenburg position.

Immediately before the operation commences the administration of subcutaneous saline by a Lane bag is begun, and it is continued throughout the operation; three to four pints of fluid are frequently given in this way. Good results have been obtained from the use of spinal anesthesia, but there is difficulty in getting the freshly prepared anesthetic, and it would appear that this is an important detail. In two instances patients collapsed suddenly after the administration of spinal anesthesia. Lately, and on the suggestion of a paper by Yandell Henderson, they have employed closed ether anesthesia. The paper above mentioned deduces evidence to show that by this method of anesthesia shock is considerably lessened. It has given them great satisfaction.

Briefly, the operative technique which they have employed is as follows:

The abdomen is opened in what would appear to be the most suitable situation and generally in the middle line. A large incision is employed. If the abdominal cavity contains a large quantity of blood, sufficient of this is rapidly swabbed away with a long roll of dry gauze to clear the view. A systematic examination of the various viscera is now carried out. They begin by picking up the cecum and recognizing the ileocecal junction; they work back rapidly along the whole length of small intestine, examining not only the gut but also its mesentery. The large intestine is reviewed, special attention being paid to the various flexures. If necessity arises the stomach on both aspects, the duodenum, the liver, and spleen are examined. It is a wise precaution to palpate both kidneys, especially the left kidney, in cases of damage to the spleen. The pancreas is reviewed during the examination of the posterior wall of the stomach. The pelvic viscera are examined last, and to facilitate their examination the residual hemorrhage is more completely cleared away. The question arises whether or not the abdominal cavity should be washed out. In early cases with extensive soiling of the peritoneal cavity they have done so; in later cases, and in those which showed evidences of peritonitis, they have not done so. They have found it sufficient to establish drainage by a single Keith tube, passing into the pouch of Douglas. In special instances they have closed the abdominal wall with through-and-through sutures of silkworm-gut, guarded where they pass over the wound junction with small pieces of capillary rubber tubing. A Doyen handled needle is the ideal instrument for inserting these sutures.

Throughout the operation speed is an important factor, coupled with every possible avoidance of shock. As regards the postoperative treatment, it is similar to that of every other abdominal operation. Special attention is paid to the administration of fluids; for choice by the rectal route, and by subcutaneous infusions.

The prognosis, of course, very largely depends on the degree of the injury sustained, but an even more important factor is the length of time which has elapsed since the injury was sustained. Early operation offers the best and surest chance of ultimate success. In reviewing the statistics of the results of such operations as these it is impossible to consider the question *en masse*. Each individual case must be considered, for the chances of success depend upon so many factors that it varies enormously in different instances.

REVIEWS.

STUDIES IN IMMUNIZATION AGAINST TUBERCULOSIS. By Karl Von Ruck, M.D., and Silvio Von Ruck, M.D. Paul B. Hoeber, New York, 1916. Price $4.00.

American practitioners have known for many years that the authors of this book have been actively engaged in the study of tuberculosis, and in the endeavor to produce substances which would better enable the body to combat this almost universal infection. Some of their results have not been generally accepted, but every one has, we think, become convinced of their earnestness and admired their persistence in following year after year the difficult task which they have set before themselves.

The opening chapters of the book deal with theoretical considerations as to the tuberculosis problem and natural and acquired immunity. Part Two deals with practical immunization against tuberculosis and describes the methods which the authors follow with the types of cases which they think most suitable. Part Three deals with experimental studies in immunization against tuberculosis in the lower animals, notably guinea-pigs and rabbits.

The book is an exhaustive one containing more than four hundred pages of rather fine type. It will not, in all probability, appeal very strongly to the general practitioner, but it will attract attention from those who are devoting themselves to the study of tuberculosis, whether it be in the laboratory or at the bedside.

VENESECTION. A Brief Summary of the Practical Value of Venesection in Disease. By Walton F. Dutton, M.D. Illustrated in Black and White and Colors. F. A. Davis Co., Philadelphia, 1916. Price $2.50.

That venesection passed too much out of fashion in the latter part of the last century is undeniable. It is now returning to its own place, but probably is not practiced to the extent that it should be. The author's design in preparing this book has been to familiarize practitioners with the class of cases in which venesection often does good. He believes it is useful in a very large number of conditions from alcoholism and amenorrhea to uremia and sunstroke.

A defect of the book is the tendency of the author to wander too far from the actual practical application of his subject, and possibly some of his readers will consider that he is too enthusiastic in recommending bloodletting under certain conditions in which many would be afraid to try it, as, for example, in typhoid fever, yellow fever, and other diseases which are distinctly asthenic in character. From time to time the author quotes cases in his own experience which seem to support the views which he enunciates, and he frankly and freely quotes from the writings of other medical men who are more or less well known.

As an interesting summarization of an important subject it can be recommended.

MILK AND ITS HYGIENIC RELATIONS. By Janet E. Lane-Claypon, M.D., D.Sc. Illustrated with Plates and Diagrams. Longmans, Green & Company, London and New York, 1916.

This book, which is published under the direction of the Medical Research Committee, National Health Insurance, of England, has its contents well described in its brief title. It contains nineteen chapters dealing with the composition of milk, its so-called biological properties, breast feeding, and the nutritive value of boiled and dry milk, the importance of milk in the induction and carrying of disease, and the presence of pathogenic bacteria in butter and cheese. Other chapters deal with the development of the mammary function, on the development of human milk, and on methods used for the destruction of bacteria in milk without the application of heat. There are eight plates, three of which are devoted to bacteriological topics and the others to the methods used in the preservation of milk and for preventing contamination. The use of electricity in the treatment of milk is also described. The chapters have attached to them very copious bibliographies.

This book is one which will prove of

the greatest interest to dairymen, hygienists, and physicians, and is possibly the best and most scientific presentation of these important subjects that has ever appeared.

THE EXPECTANT MOTHER. By Samuel Wyllis Bandler, M.D. Illustrated. W. B. Saunders Company, Philadelphia, 1916. Price $1.25.

Dr. Bandler, who is already well known because of his practical work upon Medical Gynecology, has written a little book of about two hundred pages, which is designed to place in the hands of the expectant mother in simple language a description of the processes which relate to pregnancy, labor, and the postpartum period. Attention has also been given to the subject of puberty and the adolescent girl, many of these pages being taken from the author's more technical volume.

We have often spoken of the difficulties which beset a medical man who attempts to prepare text for the laity. It is almost impossible to clearly express certain facts in non-technical language, and it is difficult to determine how deeply the author should go along certain lines.

After a brief anatomical consideration the author discusses the subject of fecundation, describes the spermatozoa and ova, and later discusses the nourishment of the ovum, the nausea-toxemia of pregnancy, the care of the breasts, superstitions about pregnancy, involvement of the kidneys, and, after this, he introduces a description of labor and postpartum states.

Whether it is wise to describe to a pregnant woman the condition called eclampsia is for our readers to determine.

The author has been wise in introducing a brief chapter upon so-called "twilight sleep," and we think that he has done well in condemning it for the average case. A passage in this chapter illustrates the difficulty of giving advice to the laity. Speaking of uterine inertia the writer dogmatically asserts that pituitary extract should be used in practically all such labors. This may be his opinion, and doubtless it is correct in a very large proportion of cases, but it may place an individual practitioner in an awkward predicament if he decides that pituitary extract should not be used in a given case and the family have this author's assertion that it should be employed.

Taking the text all in all, it is reliable, clear, and accurate, and those physicians who desire to place such a book in the hands of their patients cannot find a better one.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

Throughout the whole of this month we have experienced unseasonable weather, though it is more pleasant than great heat.

Owing to the recent offensive in France the hospitals are much more full than usual, but mostly with surgical cases. In judging of the severity of the wounds, one is of course guided by those which come under immediate notice. The cases which I have seen have been rather more severe than usual, consisting largely of septic fractures, and in several cases secondary hemorrhage has occurred. Under these circumstances, medical cases are rather crowded out, but at the end of last month quite a number of men with nephritis were admitted. These were milder than those seen previously, especially where the men had reported sick soon after symptoms arose. About a half who were seen a week after reporting sick were only passing a small quantity of albumin, which disappeared in the course of two or three days. There are still a number of men left in hospital with nerve injury, chiefly resulting from scar tissue in the neighborhood of the nerve. Improvement is very rapid in those cases in which the nerve can be freed from this tissue by operation.

The effect of the war is now becoming

obvious. Fewer young men are to be seen on the streets, and a correspondingly larger proportion of women—the difference can be observed between this month and two months ago—but in spite of the large numbers who have gone, quite a sprinkling of young men are met. Judging from appearances, these are largely of the Jewish persuasion. The proportion of bus and tram conductors who are women is on the increase, postal work is being undertaken by greater numbers, and this morning in an insurance office I found ten women and no men. The streets also show the presence of fewer vehicles, both motor and horse. This is likely to be more pronounced than even at the present time, as a large number of motor buses are being withdrawn. Every day the newspaper has notices cancelling the buses on certain routes. The lines which are being withdrawn are those which run into the country districts, but few which run along the main thoroughfares have been withdrawn. It is, however, to be expected that even those on the main routes will shortly be diminished in numbers. The reason given is shortage of petrol.

The government has now taken seriously in hand the treatment of venereal disease. It is anticipated that an increase is taking place, and will be more marked later on, accordingly preparations are being made to deal with this in the near future. The Local Government Board are acting energetically. The principle on which action is being taken is that anybody affected should have the right of treatment gratis. With this object centers are to be established where such treatment can take place, and indeed I am informed that all preparations have been made and the staff appointed in some of the larger areas in the north. At the present time syphilis seems to be chiefly aimed at, and the centers formed will largely have to deal with the performance of tests based on the Wassermann reaction. Any patient or doctor in the district affiliated to the center will have the right to send blood to the laboratory. Salvarsan or one of its substitutes is to be supplied gratis, and the injections may be given either by the doctor in charge of his patients or by a medical man attached to the center, who may be the pathologist. The centers will naturally be established in connection with preëxisting pathological laboratories. The Local Government Board are therefore asking the hospitals which at present have laboratories and skilled pathologists to come into the scheme, and to set aside a few beds for the treatment of the condition. They are prepared to pay for the accommodation supplied, and are further asking that facilities may be granted to any practitioner to learn the methods of treatment. This is therefore to be considered only a preliminary measure, which can be expanded later on when the new army is disbanded. At the present time practically all men suffering from this condition are treated in the military hospitals, either those permanently established as military hospitals, or those which are wholly or partly taken over by the military authorities. The Local Government Board are anxious that publicity should be avoided, hence there is to be no notification, and special clinics devoted to the condition are not to be held. It is, however, suggested that medical and surgical clinics should, to a certain extent, be held in the evenings, after working hours, in order that attendance may be facilitated.

This scheme coming on top of the National Insurance Act and the treatment of tuberculosis is a strong indication that the government intends in the future to have a much greater control over the health of the nation, and is a distinct advance in the right direction. This present step has been taken largely as the result of inquiries into the cause of prenatal mortality. Inquiries into this subject have, however, given an unexpected result, in that fewer prenatal deaths can be attributed to this condition than was formerly considered to be the case. The percentage is, however, still high, and should this cause be eradicated a considerable fall in the mortality should result.

Largely as a result of the war, people's thoughts have been turned to the consideration of the declining birth-rate, though the

matter had been under consideration prior to 1914, and the research instituted at the request of the Local Government Board in the cause of antenatal deaths had been initiated, if my memory serves me rightly, in 1913. In any case the subject has been brought into greater prominence through the war. A short time back a report was issued by the committee sitting to investigate this question. A perusal of the report does not bring to light any new or unexpected points, but emphasizes the fact, well appreciated before, that families are deliberately limited. Various reasons are given for this limitation. There is no doubt that the standard of life in every class has been improved, and it is pointed out that the average number of children diminishes according to the rise in the social scale. From this it has been deduced that selfishness enters largely into the consideration of the parents, and it cannot be denied that as a nation we are more pleasure-loving than formerly. But it can equally well be asserted that a general desire for the welfare and comfort of the children has been taken into consideration by the parents, who shrink from the thought of allowing their children to endure the privations and struggles through which they themselves have passed. Such parents at the present time having only one or two children, perhaps all of them serving at the front, are filled with anxiety and possibly with remorse. At the same time there are contributory factors, of which one of the most important is the tendency of the country folk to migrate to the towns. In urban districts the birth-rate is lower, and the death-rate in relation to the children is higher, and it has been recommended that an agricultural policy should be adopted in order to get the people back to the land. Again it is an obvious fact that women employed in factories are unfitted to bring up families, and the family itself is a drag on the mother who wishes to continue the life she was living before marriage. There is no doubt that in the immediate future more women will be employed in factories, though a large number of these will be spinsters. An inadequate wage is also urged as the cause of small families, but the question is promptly asked, "What is a living wage?" This question is itself directly bound up in the question of house rent, and whereas in the country districts the man's wage may be 15 shillings a week, with a house rent of half a crown and a plot of ground a quarter of an acre in size, for which he pays 5 shillings a year, and on which a considerable amount of vegetables can be grown, we find living in the central districts of London people who have to pay 12 shillings or more for a single room, in which whole families dwell, the weekly wage being only 25 shillings and everything to buy. This seems to be the root of the whole trouble, and for a number of years a fight has been going on against it in two ways: by the demolition of the slums, and by the provision of better houses which can be reached by the tram or by one of the suburban railways.

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ORIGINAL COMMUNICATIONS.

SYPHILIS FROM THE STANDPOINT OF THE SURGEON.

BY EDWARD MARTIN,

Professor of Surgery, University of Pennsylvania.

To the surgeon, syphilis is of import because of its prevalence; its protean clinical manifestations, which closely simulate tumors or the proliferation or destructive effects of other infections; and particularly because, unlike all other infection, its direct lesions are so consistently, effectually, and promptly bettered or cured by medication, that, with some exceptions, operative measures constitute a species of malpractice.

Hence to the surgeon the questions of incidence and diagnosis are major ones.

As to the incidence of syphilis, perhaps of many more or less convincing studies, Vedder's contribution (Bulletin No. 8 of the War Department, "The Prevalence of Syphilis in the Army") seems most applicable to local conditions.

A clinical examination of the West Point cadet corps failed to show a single case of syphilis.

The Wassermann survey indicated a five-per-cent incidence. From which it seems clear that from 2 to 5 per cent of the commissioned personnel of the army are syphilitic at the time they enter the service.

Since applicants to West Point are, physically, picked men, the prevalence of syphilis among college men in general is probably slightly greater than it is among the West Pointers. Moreover there is a distinct tendency for the percentage of syphilis to increase with advancing years: the older the group the higher the percentage. Vedder concludes from his study of a Wassermann survey of candidates for enlistment that about 20 per cent of the young adult male population from which the army is recruited are affected with syphilis.

In accord with this finding are the general results of a résumé of 100 cases taken at random from Dr. Stengel's service (medical wards of the University Hospital), it being his custom to have all admittances examined for the Wassermann reaction. Of this number 19 were positive. In two of these clinical manifestations might possibly have suggested the diagnosis of syphilis.

Thus if weight can be attached to this small number of cases entering the general medical ward of a hospital for the cure of diseases ranging from cholecystitis, renal sclerosis, gastric ulcer, and tuberculous pyelonephritis to goitre, and usually exhibiting neither characteristic history nor clinical signs of specific disease, nearly twenty per cent are syphilitic.

With one out of every five patients suffering from a chronic devitalizing infection, for we accept, as a working hypothesis, a positive Wassermann as a sign of active disease; and with a vaguely formulated yet fairly efficient therapeusis for this disease, it would seem well to consider it not only in its relation to individual lesions, but more broadly in its bearing upon the restoration of each individual patient to his highest possible standard of health.

Concerning diagnosis, the surgeon asks two questions: (1) Is the lesion under consideration syphilitic? (2) If not, has an underlying syphilis a distinct influence on

its progression, or upon the outcome of surgical intervention undertaken for its cure?

If these two questions can be answered in the negative the query as to whether the patient has or has not syphilis is of minor immediate moment, though it is true that the spirochete exhibiting a special predilection for the perivascular tissues and the heart muscle, by the devitalizing effect consequent on impaired nutrition, predisposes to all other infections, to neoplasms and slow ulcerative processes.

Concerning the first question, Is the lesion syphilitic? With the exception of the extragenital chancre, surgical intervention is rarely proposed for the relief of either primary or secondary syphilis.

Not infrequently chancre occupying other than its usual habitat is regarded as epitheliomatous, and excision is ordered; this particularly in the case of digital chancre as it affects medical men. It is painful, persistent, and atypical in appearance; and not until it has been cut, curetted, cauterized, and otherwise stimulated to wider growth, and usually not until the axillary nodes have been incised by a sympathetic colleague, does the patient come to "a man higher up." By which time even though spirochetes be not recovered from the ulcerating surface, a positive Wassermann, and often a secondary eruption, establish the diagnosis; which should have been made by the microscope weeks before.

The rapid evolution of chancre of the lip with the prompt and characteristic lymphadenitis is sufficient to exclude cancer. None the less some of these cases are operated upon; but the cutting of a wedge quite inadequate for cancer does no particular harm in syphilis, nor is the resultant deformity especially distressing except to him who carries it.

The major difficulty experienced by the surgeon is in the distinction between gumma and malignant tumor; a difficulty greater than ever before, since the profession is waking to the need of early intervention and sending tumor cases in the early stage of this development, when a differential diagnosis either from rate of development or physical characteristics is impossible.

Concerning bone swellings, *x*-rays give us even at this stage such pictures as usually enable us to determine with a fair degree of certainty the syphilitic, tubercular, or neoplastic nature of the enlargement.

No such help is afforded in tumor of the soft parts, and in the absence of a history or associated signs we have at our disposal wide excision and microscopical examination, the method of choice when such involve neither crippling nor gross deformity: or laboratory tests and the effect of vigorous antisyphilitic treatment.

Since the luetin test has not been helpful we depend upon the Wassermann reaction, placing much faith in a strong positive and none whatever upon a negative; looking forward with more hope than confidence to that day when the serologists, each renouncing his personal antigen and standardization, may unite upon a uniform method, sufficiently sensitive for human nature's daily food, but not subject to such vagaries as make possible a different report upon the same serum from each of three experts.

In the presence of a lesion which may be syphilitic, an active antisyphilitic treatment is started and pushed with a cheerful enthusiasm if the Wassermann be positive; with grim determination if it be negative. The treatment, usually by arsenic and mercury, the latter by inunction or hypodermically, is pushed to its limit. The limit of arsenic is shown first by polyuria, it being a vascular poison, later by a diminution in the quantity excreted. The limit of mercury is shown by proteid and casts, it being an epithelial poison; often before this it is shown by breath fetor and hypersecretion of saliva.

The limit of both or either drug is loss of snap and spirits, loss of appetite, loss of weight. To touch this limit lowers the patient's resistance, poisons him more than it does his spiral guests. Each patient has a definite dose which should always be short of the limit as above defined. Moreover the tolerance for these drugs is greatly in-

creased by sweating baths, free diuresis, and regular bowel evacuations, at least once a day.

If betterment does not occur within a week or at most two weeks, regardless of a positive or negative Wassermann, the lesion is considered as non-syphilitic and is so treated. The betterment of a specific lesion under well-directed treatment occurs quickly.

There are in our hospitals at this moment some thousands of patients perishing from the corrupting influence of a positive Wassermann upon the mind of the surgeon; drained by the steady progression of a condition which calls for prompt surgical relief, and even more actively sapped by the long-continued futile administration of mercury, arsenic, and iodide of potassium.

When the lesion is surely non-syphilitic though the Wassermann be positive, the question arises as to supplementing the surgical procedure by specific treatment; nor, if it be accepted that a positive Wassermann is a proof of active spirochetes, and that a harmless course of treatment will either quiet or kill them, would any but an affirmative answer seem logical.

The reason for not so answering and acting is based on absence of symptoms—meaning by this word gross functional or structural changes.

The earliest symptoms of any chronic infection, and this is particularly true of the spirochetal ones, are psychic, manifested particularly by an easier mental fatigue and unrefreshing sleep. Thereafter in weeks or months follow a lessened power and endurance of mental concentration, and often a change in temperament appreciable only by those closest to the patient. Later come gross psychic and physical derangements. Even in the presence of perfect mental and physical health a positive Wassermann indicates treatment, in the hope that it may change the positive to a negative, a hope rarely realized; in the belief that it may postpone or prevent later development of gross lesions and symptoms.

The positive Wassermann should be put on spring and fall treatment for life, or so long as his reaction remains positive.

PREVENTION AND LIMITATION OF DEFORMITY IN INFANTILE PARALYSIS.

BY ADOLPH COHN, M.D.,
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The sacrifices offered at the altar of infantile paralysis will not have been in vain if it shall awaken the physician to a better knowledge of the prevention and limitation of deformity in this dread disease. The epidemic raging in New York will have its beneficiaries in the countless multitudes who may become afflicted with this disease, by creating general discussion as to means of prevention, as well as treatment of this disease soon after its inception. It has been my experience that cases of infantile paralysis brought to the orthopedic clinic rarely come with a diagnosis of having had infantile paralysis, but give a history of having had pneumonia, rheumatism, malaria, summer complaint, severe attacks of fever, and the like. These histories, as a rule, are a commentary on the work of the physician handling the case, although occasionally the cases are neglected and treated by the parents with so-called home remedies prescribed on the advice of the druggist or neighbors. (This is particularly true in the poorer sections.) While we recognize the difficulty of early diagnosis, especially in sporadic cases, it is of importance to bear it in mind.

When a physician is called to see an infant or young child presenting the symptoms of fever accompanied by pain in the back or extremities, particularly in hot weather, he should interest himself in the ultimate outcome of the case. The physician need not be an alarmist, but in a tactful way might explain the possibilities and ask that he be notified if certain symptoms suggesting this condition be present. If he

find the case to be one of infantile palsy, then the amount and kind of deformity will depend largely on his skill in handling the case. Jones of Liverpool says: "By a proper appreciation of the available therapeutic and mechanical agencies we need rarely if ever encounter any paralytic deformity."

While I believe this statement a little too strong, I do believe the severity and nature of the deformity can be greatly improved by proper treatment. The general practitioner should not hesitate in calling an orthopedist in consultation any more than he would hesitate in calling a general surgeon in a pus or gangrenous appendix. To condemn a child to deformity for life, such as I have seen in some cases, is worse than condemning it to death, for some of these cases are a burden to themselves and to those on whom they depend.

Of the therapeutic measures rest (this includes the prevention of postural errors) is the most important; not comparative but absolute. If the trunk muscles be affected, for example, and the patient allowed to sit up too soon, it may result in some of the severest deformities of the back and pelvis. I well recall a case brought to Dr. Mann at the Medico-Chirurgical Hospital which was but "a human mass of putty." Such deformity as this child had could largely have been prevented and limited with intelligent care and treatment. The ambulatory treatment described by Lovett (*Journal A.M.A.*, Aug. 5, page 422) I believe is harmful and conducive to deformity. That the parts will regain themselves to a certain extent is well known, but how much power a given part will regain is impossible to tell and therefore the desire of the family to know how the patient is progressing. This leads a weak-willed physician to pay attention to the importunities of the parents and relatives permitting the child to use the parts too soon. "Because of the general muscular weakness and the unequal pull of the trunk muscles, the asymmetric methods of walking and standing and the faulty superimposed weight, or the one-sided use of the arms in cases of paralysis of the upper extremity, all motions tend to exaggerate the development of the deformity, when once under way." (Bradford and Lovett.)

During the stage of onset rigorous measures should be adopted in order to limit the destructive processes in the cord, this having an important bearing on the prognosis. I want to call attention to one measure in particular during this stage, and that is lumbar puncture. I believe a lumbar puncture, by reducing the pressure in the cord and lessening congestion, has a marked beneficial effect, and at the same time is valuable as a diagnostic aid. (Increased pressure in the cord is evidenced by spurting of the fluid on lumbar puncture, bulging fontanelles, and McEwen's sign.)

Active treatment should be commenced after the hyperesthesia has passed. Frauenthal recommends the D'Arsonval and Oudin currents soon after the onset, but I believe no advantage is to be gained, and I can only quote from a paper by W. J. Mayo that electricity has cheaply earned credit for benefits which time effects. Electricity is of benefit in the later stages, as I will mention in a subsequent part of my paper.

The surgeon rarely sees these cases until after paralysis is present. The stage of paralysis can be considered from the time the hyperesthesia and the contractions of the early stage have passed until the time when the power has been regained to as great an extent as possible. "Many of these contractures and deformities are preventable by the maintenance of the integrity of the muscle structure where weakness would allow overaction on the part of the unaffected opponents, and by plastic splints" (Frauenthal). The need of early detection of a faulty posture cannot be overemphasized. Jones of Liverpool believes rigid fixation of the head and spinal column in all cases (whether pain be present or not) should be carried out in accordance with the general principles which guide us in the treatment of an inflamed area. Splints if used, however, should not cause pressure and interfere with the circulation; for this reason plaster bandages that encircle the limb and splints that are secured by bandage

are inadvisable. Frauenthal recommends a light aluminum splint applied to the heel and plantar surface of the foot, projecting an inch or more beyond the great toe; this keeps the pressure of the bedclothes from the part and prevents toe-drop, the commonest deformity in these cases. A simple posterior wire splint run up beyond the knee and above the great toe can even be more serviceable.

We should now direct our attention to regaining as much nerve and muscle power as possible. This may be carried out by

1. Muscle training or reëducation.

2. Physical measures, such as (*a*) hydrotherapy, (*b*) massage, (*c*) electricity, (*d*) baking.

3. Mechanical apparatus.

Muscle training or muscle reëducation I believe to be the most important therapeutic measure at hand during this stage, and will be productive of invaluable results if properly carried out. The value of this work has been greatly enhanced by the use of the muscle test as described by Lovett and Martin (*Journal A. M. A.*, March 4, 1916). Muscle training is carried out by putting the part through passive motion in the direction desired. The patient is then told to make these movements voluntarily, the operator assisting to complete the motion. In this way as the muscle power increases the assistance decreases. These exercises are greatly improved if performed before a mirror as suggested by Frauenthal. Muscle training attempts to drive an impulse from brain to muscle in order to enable it, if possible, to open up new paths around affected centers in the cord (Lovett). This training must not be carried to the point of fatigue, but must be slow and moderate and gradually increased. Too much exercise is harmful, as evidenced by the muscle test of Lovett and Martin. In carrying out these exercises the assistance of an expert is advisable wherever possible; however, the constant, faithful assistance at home is preferable to expert attention at irregular and infrequent intervals.

Hydrotherapy: Warm baths are of value for a number of reasons. In the first place the circulation of the limb is stimulated and the hyperemia induced tends to counteract the trophic loss of the lesion (Frauenthal and Manning). Then, again, movements are better carried out with the limbs immersed in water, as the water supports the weight of the limbs. Splashing and kicking should be encouraged while the patient is in the water. However, these movements should be supervised so as to avoid postural errors.

Massage is of value in all stages after the subsidence of the hyperesthesia. It is beneficial because of the mechanical stimulation, and promotes muscular tone. Massage, however, like all good things, is often abused; it should be recognized that it is only valuable as an adjunct to other forms of treatment, and is not to be relied upon alone. Too much stress cannot be laid upon this point.

Electricity: Here we come to a therapeutic agent the value of which is disputed. The consensus of opinion is against early use during the acute stage. In the paralytic stage I believe it is of great value, if intelligently employed and in ethical hands. The currents employed may be galvanic, faradic, static, and high frequency. The high frequency and static are used for their influence on nutrition, while the galvanic and faradic are used for their effect on nerves and muscles. The electrodes should be applied to the origin and insertions of the muscles. The faradic current is used if the muscle responds to it by contracting, otherwise the galvanic is used until contraction is produced, and then the faradic is resumed. The current should be the weakest that will produce a contraction, and the treatment should be short, about one to two minutes for a muscle group. The galvanic current may also be used over the nerve trunks. The attendant should be tactful in giving treatments, especially to children, otherwise the fear of the treatment may interfere with its successful accomplishment.

Baking by the application of heat to a limb which is otherwise cold maintains the part in a state of warmth which is of benefit to its nutrition, and at the same time

renders the circulation more active, making a condition more favorable to muscular contraction. It soon becomes evident that this treatment permits the warmth and activity of the circulation to become more and more permanent as time passes.

Mechanical splints and braces are of inestimable value in infantile paralysis when properly used, but are detrimental when abused. The abuse is both on the part of the patient and the physician. The physician abuses braces by simply sending a patient to a brace-maker without specifying the requirements, leaving the matter entirely to the brace-maker. As Rugh said recently, "This is about as intelligent treatment as sending a case of pneumonia to the druggist and saying, 'Here is a case of pneumonia; give it the proper drugs.'" The parents or guardians are apt to abuse braces by believing that once a brace is applied they have fulfilled their duty to the case and have done all that is possible, relying on the brace to effect a cure.

Mechanical appliances to be satisfactory must be light, easily applied, inexpensive, and simple in construction. The purposes of these appliances should be (1) to prevent deformity; (2) to correct any that may be present; (3) as a means of locomotion and support.

Braces need frequent adjusting, and the patient should be impressed with this fact as well as that the treatment has just begun, as far as the brace is concerned, and not ended. If this were borne in mind many destructive operations would be avoided.

Operative measures for the limitation of deformities are in many cases necessary because of inefficient treatment. They should not be resorted to for at least two to three years after the disease has started. The paralyzed muscles have been found to regain power as late as four and five years after inception of the disease. Therefore early operation is an admission of inefficiency (in nearly all cases). When operation is necessary the procedure may be:

1. Tenotomy: The peroneal group of muscles being most frequently affected the commonest deformity we have is an equinus. When stretching or stretching and plaster cast is insufficient a simple tenotomy of the tendo Achillis is necessary.

2. Muscle and tendon transplantation: This procedure offers by far the most desirable result in limiting deformity. A sound muscle or tendon in the vicinity of the paralyzed muscle or tendon is necessary. Periosteal insertion (with silk extension if necessary) has been found more advantageous than tendon grafting—that is, insertion of a healthy tendon or muscle into a paralyzed muscle or tendon.

3. Destructive operations such as arthrodesis, resections of joints, and osteotomy are performed only when all other methods fail, or when the case is of long standing. Astragalectomy may be mentioned here as an admirable procedure in certain pronounced foot deformities; this operation is being performed where formerly arthrodesis was used.

4. Silk ligaments also have their advocates, and when successful are a good procedure.

5. Nerve transplantation may be mentioned as a promising procedure, but as yet sufficient work has not been done to make it common.

CONCLUSIONS.

(*a*) Importance of early and proper diagnosis.

(*b*) Advisability of consultation with an orthopedist.

(*c*) Value of lumbar puncture as an early procedure.

(*d*) Importance of absolute rest.

(*e*) Value of muscle training and muscle reëducation.

(*f*) Massage, hydrotherapy, electricity, and baking are of benefit when properly coördinated and carried out jointly with one another.

(*g*) Necessity of the physician being able to give proper instructions when desiring to have a brace made.

(*h*) Necessity of proper care of braces under physician's observation.

(*i*) Operative procedures as last resort after waiting several years, or because of lack of treatment or improper treatment.

(*j*) Muscle and tendon transplantation is the operation of choice wherever possible.

THE TECHNIQUE OF INTRAVENOUS MEDICATION.

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The purpose of this paper is to direct attention to what the author believes to be the correct technique for the intravenous injection of medicinal agents, and to likewise call attention to the large number of medicaments that are being used in this manner, with reference to literature, where the subject may be studied in detail.

Medicine may be introduced into the circulation by a number of routes, such as the mouth, stomach, rectum, respiratory tract, veins and arteries, subcutaneous cellular tissue, and the integument.

One of the most satisfactory methods of medication is by the intravenous route, or direct injection into the venous bloodstream, but in American medical practice this has been reserved for emergencies, when other routes were not available, and where immediate action was necessary for the preservation of life.

The physicians of Italy, Spain, Portugal, France, and perhaps to a lesser extent Germany, have for years resorted to intravenous medication, not reserving this method for emergency work, but in thousands of instances making it the route of choice, because of its many conveniences. American physicians have not done so because their education has taught them to regard the blood-vessels, in fact the entire cardiovascular system, with awe, and because entering a vein has always been considered a dangerous and complicated operation. The illuminating advent of salvarsan has done more to educate American physicians to a proper attitude, and to familiarize them with intravenous medication, than any other one thing.

Medication by the subcutaneous route, by means of a hypodermic syringe, has been practiced in the United States to a very great extent, and doubtless every physician feels capable of applying this means with impunity, yet hesitates, through the fear engendered by early training, and augmented by lack of experience, to approach the intravenous, which possesses many advantages over the subcutaneous route, advantages alike to the patient and to the physician.

In one of the last editions of a noted work, which is used as a text-book in nearly every medical college in this country, occurs the following sentence:

"The intravenous injection of medicines is a method which is to be employed only under extraordinary circumstances, and with only a few drugs, as, for example, salvarsan in syphilis and quinine in pernicious malaria."

It is just this sort of teaching which has deterred the average American physician from making use of the simplest, easiest, and most satisfactory way of injecting medicaments. Our foreign professional brethren are far in advance of us in this respect.

Veins have been injected at the same point, or very close to the same point, more than fifty times, with no unfavorable consequences of any sort. The much-discussed danger of air-embolism has, I believe, been greatly exaggerated and is easily avoided. Eleven years ago (*Surgery, Gynecology and Obstetrics,* December, 1905) the writer called attention to the needless fear of air-embolism, and detailed a large number of experiments tending to show that the disastrous consequences of air-emboli were grossly exaggerated.

Abroad, the results achieved by remedies when injected intravenously are considered much more definite and excellent than when the same remedies are given by the mouth or subcutaneously. These opinions apply not only to morphine, strychnine, and other drugs ordinarily given subcutaneously throughout the medical world, but to such agents as iron, arsenic, mercury, and phenol, which, if not entirely, are still most usually administered by the mouth.

The Technique of the Injection.—The undressed patient, who has had no food for

several hours, should be in bed, in a recumbent position, either at home or in the hospital, with no pillow under the head. A standing or sitting posture during the intravenous injection may result in syncope. (See illustration No. 1.)

The skin over the median basilic or median cephalic vein, at the flexure of the elbow, should be thoroughly cleansed with antiseptic soap and water, followed by sponging with alcohol.

A suitable syringe, with a needle the shaft of which is no larger than 26 gauge or longer than 5/8 inch, should be sterilized by boiling and charged with the medicament to be injected. The arm, just below the elbow, should be massaged firmly with a downward stroke toward the fingers, and then firm compression around the arm should be made by means of an Esmarch bandage, a rubber band or tube, or, if these be not at hand, a firm cotton or linen bandage may be employed. The compressing material should not be tied, but merely held tightly by twisting, so that it may be instantly loosened by the assistant, who should be in charge of this part of the work; or the compressing material may be held by a strong artery forceps, which can be instantly loosened by the assistant, or the operator in case there is no assistant available. The object of the compression of the arm is, of course, to engorge the veins so that they may stand out prominently and so facilitate the operation, and to assist in this the patient should be directed to tightly clench the fist.

Although the median basilic vein is larger than the median cephalic, it is in close relation to the brachial artery, from which it is separated only by fascia, so that the danger of wounding the artery by an accidental transfixion of the vein with the needle suggests the advisability of choosing the median cephalic vein.

No. 1.—Proper posture for the patient.

The operator firmly grasps the arm of the patient with his left hand, seating himself comfortably at the side of the bed, or standing so that he is not in a strained position. (See illustration No. 2.)

With the filled syringe, from which air has been excluded, in his right hand, the operator places the shaft of the needle directly over the center of the vein, parallel

to its long axis, then points the needle toward the vein, holding it at a very acute angle to its long axis. Firmly, but gently, the point of the needle is then forced through the skin, with a lifting motion, until a sudden lack of resistance indicates to the sense of touch that the point of the needle has entered the vein. The needle should be forced through the skin and into the vein so slowly that there will be no possibility of wounding or piercing the distal wall of the vein by the added force produced by the lack of resistance when the needle pierces the peripheral wall.

No. 2.—Syringe needle entering the vein.

If the needle is thought to be in the vein the syringe should be held perfectly still for a few seconds, when the appearance of a small stream of dark blood running into the medicament will indicate that the needle is in the vein and everything therefore ready for injection. Some operators withdraw the piston of the syringe slightly, to induce the entrance of venous blood into the syringe, but this is unnecessary.

Others prefer to introduce the unattached needle, and after it has proven to be in the vein to then attach the syringe. This is not as good technique as the method described above and is more difficult. The danger of the needle slipping when attaching it to the syringe, or of transfixing the vein, is entirely avoided by the procedure suggested.

When the needle is in the vein, then the piston should be forced down with a screwing motion, turning it round and round, and pushing it forward gently at the same time. This controls the speed of injection much more perfectly than is possible by holding the syringe in the ordinary manner and making pressure on the piston with the thumb and counter-pressure on the barrel with the first two fingers. (See illustration No. 3.) There should be the slightest possible lapse of time between determining whether the needle is in the vein and the beginning of the injection. Much delay at this juncture may result in the coagulation of the blood in the fine caliber needle, which may be forced into the vein as an embolus when the injection is begun, a complication, of course, to be avoided.

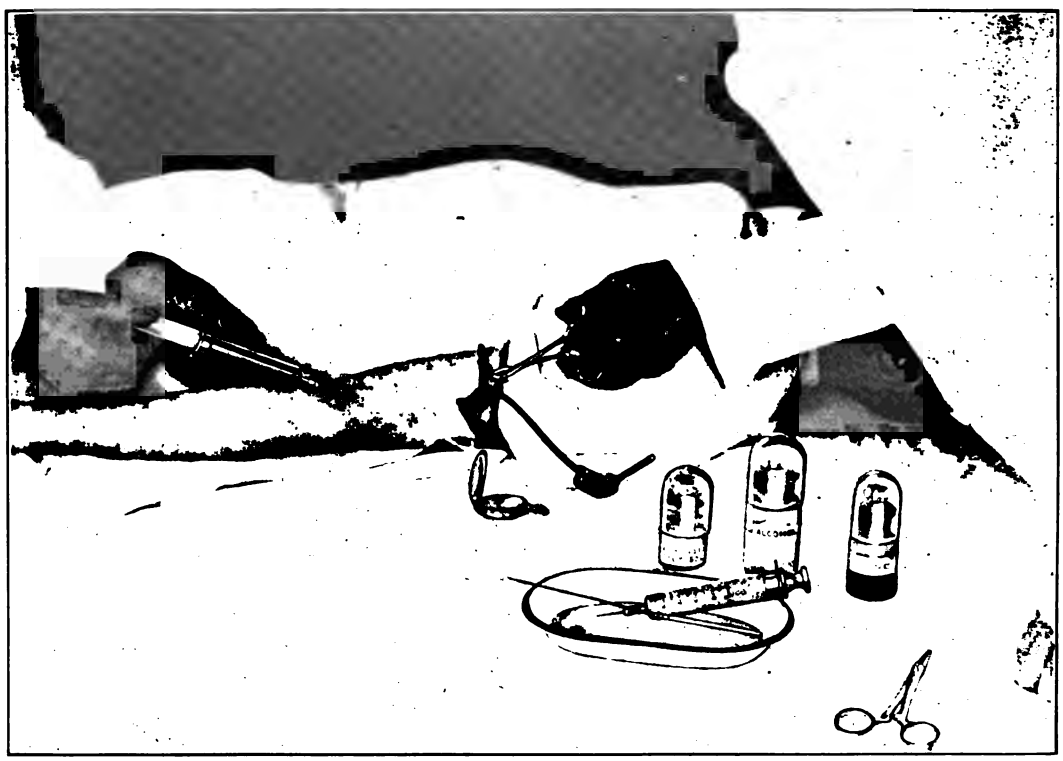
The actual injection of the medicament, however, should proceed with extreme deliberation and slowness, not more than 1 Cc. being injected in one minute. If more of the medicament than 1 Cc., in total quan-

tity, is to be injected, the rate of injection should be approximately one minute to each Cc. It would, therefore, require two minutes to inject 2 Cc., three minutes for 3 Cc., and so on. It is a great help to have an assistant check the time and indicate the speed of injection with the aid of a watch, with frequent promptings, because time seemingly passes very slowly under such circumstances, so that one minute seems like ten to the operator, as has been proven by many experiments.

The constricting bandage around the arm should not be released until the needle is in the vein. The injection should not be begun until the constriction is released. In other words, when the needle is in the vein, and the operator is ready to begin the injection, he should then, with his right hand, release the bandage or direct the assistant to do so. This should be done very carefully, however, so as not to disturb the position of the needle in the vein. When the bandage has been released the injection should be begun, but not before.

When a medicament has been injected the needle is quickly but gently withdrawn and the point of injection should be touched with tincture of iodine. It is not necessary to seal this tiny wound with collodion, although some operators prefer to do this. (See illustration No. 4.)

The patient should remain in bed in a recumbent position for an hour or two after the injection so as to disturb the cardiovascular system as little as possible. It is good practice for the physician to remain in attendance for perhaps an hour after the injection, or until all likelihood of any reactionary symptoms has passed.



No. 3.—Starting the injection.

In the aged, when the patient is weak or his condition bad, some stimulation at the time of injection is good practice. One-thirtieth grain of strychnine subcutaneously, or other stimulants, may be given as required.

It is the author's opinion that intravenous injections should never be given in the physician's office. The application of medicaments by the intravenous route, while a

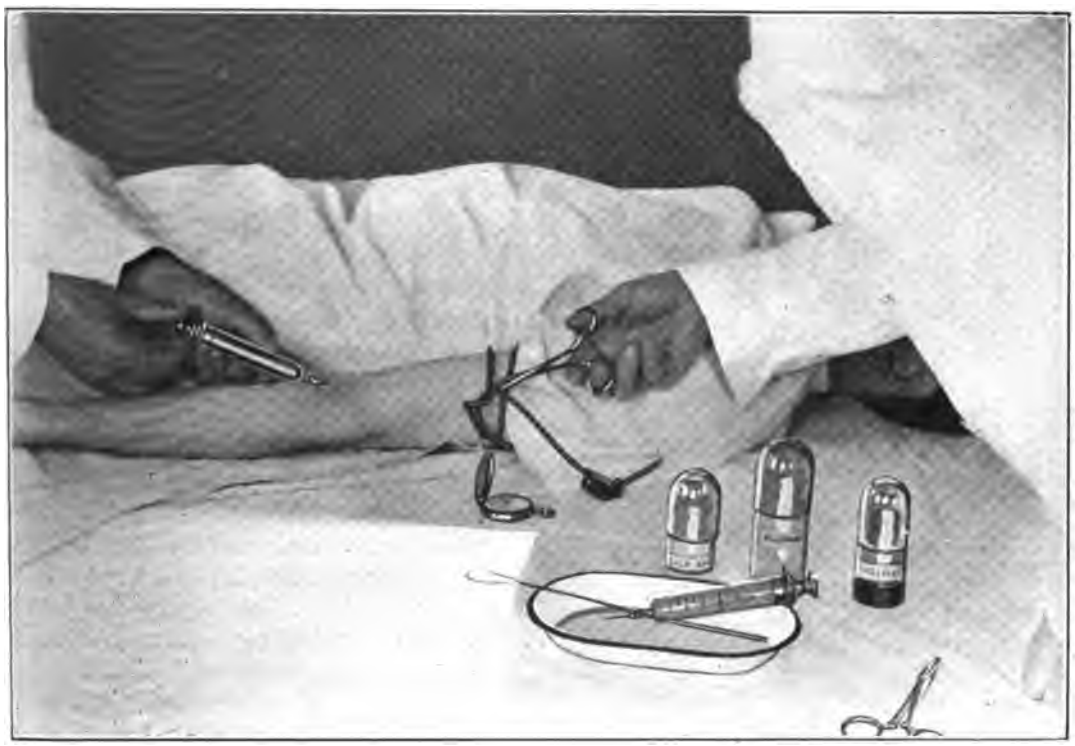
simple and almost uniformly satisfactory procedure, should not be lightly undertaken, but approached with due respect for the cardiovascular system.

The very finest needles should be used. The point of the needle should be perfect and its surface highly polished. It is far better to use a new needle every day than to risk one's reputation for skill by employing a blunt-pointed or rough-surfaced instrument.

If the solutions employed are sterile, the needles small in caliber, sharp, clean, and dry the syringe and the needle, preventing it from rusting, and keeping the instrument in good condition until the next injection.

Some medical text-books state that: "In some instances it may not be possible to puncture the vein without exposure thereof through an open incision, and it is much better to resort to the latter means in difficult cases than to run the risk of infiltrating the tissues."

The author has made many hundreds of intravenous injections and has yet to find an instance where it was necessary to resort to



No. 4.—Injection completed.

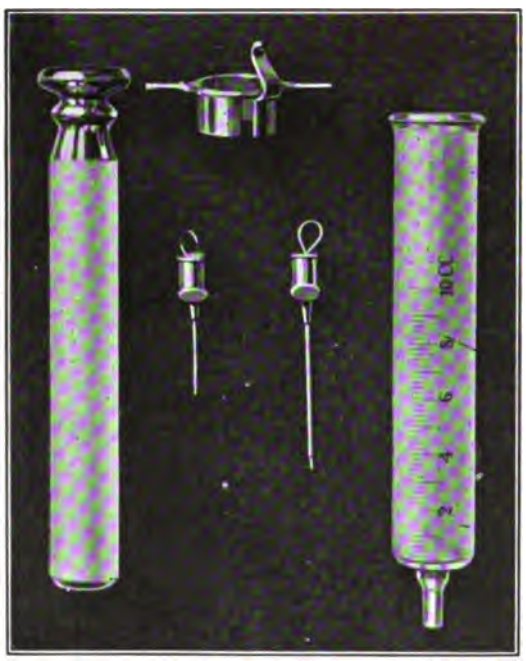
bright, the injection delivered into the blood stream, and not into the wall of the vessel or the tissues surrounding it, there is no danger of producing indurations or local reactions, and the satisfaction derived from making intravenous injections rapidly and confidently will be appreciated both by the administrator and the recipient.

After using the syringe, force out all liquid, rinse it with sterile water, and then with alcohol, including the needle in this operation, before returning the instrument to the case. Alcohol will serve to rapidly exposure of the vein. If, for some reason, as adiposity, veins in the bend of the elbow cannot be engorged sufficiently to make them prominent enough for the purpose, then a vein on the back of the hand, on the dorsal surface of the foot, in front of the internal malleolus, or on the anterior surface of the leg, may usually be found sufficiently prominent.

A little care, skill, and patience, combined with some experience, will invariably make it possible to perform intravenous injections without resorting to the possibly dangerous,

and far more complicated, surgical operation of exposing the vein through an open incision. The writer firmly believes that this operation is not necessary or justifiable more than once in a thousand times.

It is not unusual to read, in recent editions of standard text-books, the admonition to "inject a few drops of cocaine into the skin, over the point selected for intravenous medication, to render the operation painless." This is utterly absurd and entirely unnecessary. If performed as I have described it, the operation is painless. It is most unusual to have a patient complain of



No. 5.—"All-glass" syringe for intravenous injections.

pain, and it is nearly always the case that if asked the patients will state that they felt practically nothing. A properly made intravenous injection is immeasurably less painful than the ordinary subcutaneous injection.

By using a very fine needle, there will be no scars in the region where the injections are made. Where a great many injections are made sometimes patients complain bitterly at the slight scars, indicating the puncture marks, that remain where large caliber needles have been used. This may be more or less inconsequential, but the esthetic factor must be considered and the psychic element as well. This may be entirely avoided by the use of fine needles.

Kind of Syringe.—The great majority of syringes, while cleverly constructed, are not suitable for carrying out the principles of asepsis. Either they cannot be made sterile by boiling, on account of leather or rubber packing of the pistons, or they are easily disarranged, or are too complicated to be taken apart for cleaning. The simpler in construction the instrument is the better. The writer is strongly of the opinion that the ideal instrument for intravenous injection is the simplest of all in construction—*i.e.*, the "all-glass" syringe, which consists of but two parts, the barrel and the piston, both of glass, ground to fit closely. Such syringes are easily obtained of instrument dealers and are usually fitted with a slip joint, which is ground to a standard size so that needles which can be easily and accurately attached are readily obtainable. Most of these instruments are provided with a metal attachment which slips over the barrel, with projections for the fingers so that counter-pressure against the piston may be made. Some of the older designs are provided with a little chain and a wire clip, which is intended to hold the piston from dropping out of the barrel and thus becoming broken or septic. A recent improvement consists of a little spring clip which does away with the bothersome chain, but which holds the piston at the desired point. (See illustration No. 5.) So little pressure is applied that it does not interfere with the movement of the piston, but it is sufficient to prevent slipping, thus retaining the piston at any selected point.

The small syringes, known as "hypodermic syringes," are not so well adapted for intravenous technique as those of larger capacity, the writer's predilection being for one of at least 10-Cc. capacity, since it is desirable in many instances to dilute the solution for injection with physiological salt solution.

Filling the Syringe.—To the uninitiated, filling the syringe from the small ampoule may appear difficult and complicated, but in

reality it is quite simple; it merely calls for a little manual dexterity, easily obtained by experimenting in the quiet of one's office. The fluid in the stem should be shaken into the bulbous portion before opening the ampoule, and this is readily accomplished by snapping the finger against the ampoule while holding the stem upright. These ampoules come in various shapes, but in general they are quite similar. In some instances there is a file-mark on the stem, indicating the point of breakage; others have no such mark, but a small file is provided. I have seen some that have neither file-mark nor file, but in any event they may be easily broken by holding in the hand the bulbous portion of the ampoule, and then, with a piece of gauze or towel covering the tip, the stem can be broken off by a quick bending motion.

With the thumb and first finger of the left hand firmly grasping the ampoule, which is in an inverted position, the opening pointing downward, the needle of the syringe is introduced carefully into the opening. The needle should not be introduced far into the cavity of the ampoule, but only slightly inside the broken opening. The syringe can be held firmly in the same hand by making pressure with the third or little finger, or both, against the palm of the hand. The right hand is thus left free to gently withdraw the piston. This should be done slowly and gradually, and thus the entire contents of the ampoule may be withdrawn. Plenty of practice will insure against possible embarrassment. Before opening, the ampoule is washed off with alcohol or rubbed with a pledget of cotton dipped in alcohol. (See illustration No. 6.)

If the bottom of the ampoule is square or flat, or is provided with a little pedestal, it nevertheless must be supported in the manner indicated while filling the syringe, since proper needles for intravenous injections are so short that they cannot, by any possibility, reach more than half-way down in the ampoule, thus effectively preventing withdrawing all of the contents of the ampoule.

Drugs and Solutions.—It is of the highest importance that drugs, intended for intravenous injection, should be pure, reliable, accurate in dosage, sterile, and thus ready for immediate use. Probably every physician realizes that the method of making solutions for subcutaneous injection, by dissolving hypodermic tablets in ordinary water, and in vessels not previously sterilized, is open to the criticism of being technically unscientific and incompatible with the teachings of modern surgery.

No. 6.—Filling the syringe from ampoule.

A solution of a drug intended for intravenous use *must* be sterile, and sterile solutions, put up in hermetically sealed glass containers, are products that are instantly available and indispensable in emergencies. Consequently, the physician finds these most convenient because he may rely upon their safety, which he cannot always do when he prepares medicaments for injection in the usual extemporaneous way. It

not infrequently happens that when a physician finds it necessary to make a subcutaneous or intravenous injection, he does not have the necessary materials at hand. He must wait for water to boil and cool. He realizes that the mass of the tablet that he is to dissolve in his sterile water contains, in addition to the active principles he wishes to use, materials which are unnecessary, and possibly undesirable. Sterile solutions, hermetically sealed in glass, overcome all of these handicaps and meet all the requirements.

The medicaments to be employed require careful investigation and are not easily prepared extemporaneously. An essential element of successful intravenous medication is the special preparation of the remedies themselves.

Solutions of all of the injectable drugs should be made from absolutely pure products in vehicles of which the composition should also be the object of great care. The solutions, containing accurate doses, are put into small glass bulbs, or ampoules, which are then hermetically sealed by heat and subjected to careful sterilization, the method of sterilization being adjusted to the particular product, so that substances liable to be decomposed by heat are not injured. Such solutions, after being sealed in glass bulbs, are kept under observation for a certain length of time, at the expiration of which they are carefully tested chemically and physiologically to ascertain their activity and stability.

Each bulb, or ampoule, has a capacity of 1 Cc., which usually represents a single dose.

Sterile solutions of various drugs for intravenous medication, possessing in a high degree the necessary qualifications for intravenous injection, are readily obtainable in Europe, and American manufacturers seem to be rapidly following in the footsteps of their foreign competitors. Many drugs are injured in attempts to sterilize them by boiling, some are decomposed and made worse than useless. Correct sterilization then is not so easy as it appears, but must be adapted to the physiochemical properties of each preparation. In high-class laboratories this is well understood. and each preparation is prepared in accordance with its individual needs. It is now possible to obtain solutions ready for use, in small glass ampoules, hermetically sealed by heat. These ampoules are put up in suitable packages for convenience and safety (see illustration No. 7), and many physicians make the practice of carrying an assortment of these ampoules in a special case or in their bag.

Where physicians must make up solutions more or less extemporaneously they are always handicapped by the water available. Of course, it may be sterilized by boiling. but it may be too "hard" or contain iron or free alkali. If not correct in chemical reaction it may so seriously derange the delicately adjusted chemical formulæ of the medicaments as to make them unfit for the purpose intended. The only water proper for solutions for intravenous use is sterile *distilled* water. For diluting to a larger volume, as is sometimes desirable, use only sterile distilled water, plain, or containing salts to make it isotonic to the blood serum. The term "physiological salt solution," as ordinarily used, means common table salt in the strength of 0.7 per cent, or 90 grains to the quart, in ordinary boiled tap water, which cannot be filtered owing to the environment. It is well understood that boiling sterilizes the water, but it will still contain the dead bacteria or fungi which were primarily in the water, and these particles of proteid matter in many instances may prove highly undesirable. The proper method is to use distilled water, which has been repeatedly sterilized by boiling and which contains: Calcium chloride 0.25 gm., potassium chloride 0.10 gm., sodium chloride 9.0 gm., to one liter.

This combination of chemically pure sterilized salts, in the amount of water given, forms as nearly as possible a solution which is isotonic with the blood serum. The researches of Ringer, of London, and later Loeb, Howell, and Locke, of Boston, have shown that this combination produces a solution which is practically isotonic with

blood serum and has no injurious effect upon the red blood-corpuscles; it should, therefore, be preferred to improvised solutions. Wherever a physician is operating in a hospital such solutions should be at hand. Where, however, the injections are to be made in the patient's home it may not always be possible to have this isotonic solution ready, although a small amount may be carried in a rubber-stoppered bottle, as would be the case if the physician was making intravenous injections in a routine way. Failing the isotonic solution, ordinary tap water, boiled and cooled after the salt has been added, may be employed without very much danger, as the author believes that the complications described in textbooks, while theoretically tenable, are much exaggerated.

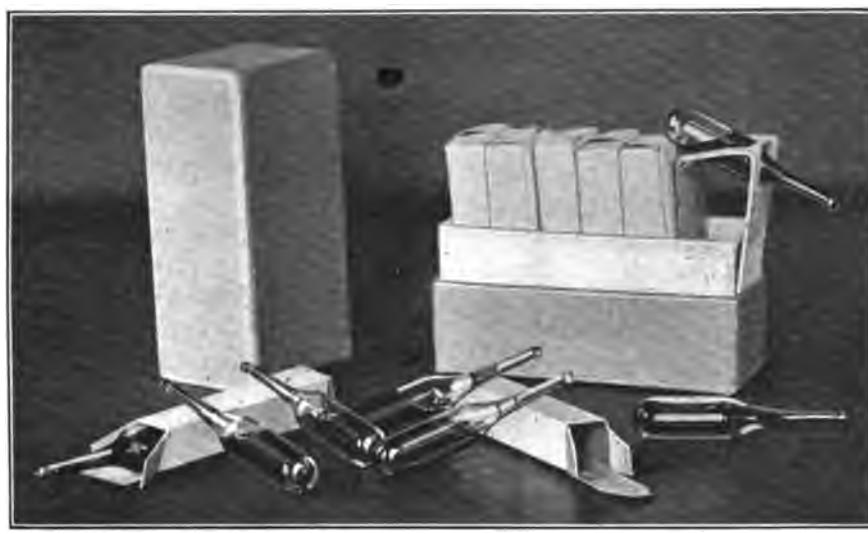
A search of the literature will reveal the fact that a very large and diversified list of drugs have been successfully administered intravenously, some of which will cause surprise owing to their chemical nature. Space permits mention of only a few of the more important drugs in such a list, as the following:

The intravenous injection of mercurialized serum, either autogenous (human serum) or horse serum, containing very small amounts of mercury bichloride, have been employed for the treatment of systemic syphilis. (See *Journal A. M. A.*, December 19, 1914, page 2182, and May 1, 1915, page 1471.)

Pituitary extract has been employed in small doses, injected intravenously, to increase the blood-pressure in toxic blood-pressure depression following infectious diseases, or operations, or great loss of blood.

Quinine dihydrochloride has been employed by intravenous injection in severe types of malaria and in other conditions where a rapid quinine action was desired.

Sodium salicylate has been given intravenously in acute rheumatic fever with cardiac complications in cases of gastric intolerance to the salicylate.



No. 7.—Sterile solutions in hermetically sealed glass ampoules.

Among others I mention adrenalin (1), colloidal mercury (2), colloidal silver (3), colloidal selenium (4), salvarsan (5), glucose (6), atoxyl (7), ether (8), gold and potassium cyanide (9), sodium bicarbonate (10), silver nitrate (11), quinine hydrochloride (12), anthrax serum (13), sodium fluoride (14), strophanthin (15), cholera serum (16), antidiphtheric serum (17), antityphoid serum (18), chloroform (19), digitalone (20), digalen (21), hirudin (22), antitetanic serum (23), and phylacogen (24-25).

CONCLUSIONS.

In concluding, it is realized that the average American medical man will consider this method a dangerous therapeutic innovation and regard it with suspicion. I am very sure, however, by reason of close observation and considerable experience, that this form of medication deserves the very serious attention of the American medical profession.

The physician who makes use of it will soon learn that the intravenous route is decidedly advantageous to the patient, since the medicament is not subjected to influences that may reduce its potency or interfere with its physiological action. Certainty and directness of action are secured by this method of application.

Intravenous injection should be employed without hesitation when the case is urgent or the tissues edematous, or the circulation is so feeble that absorption is slow.

When a drug suitable for the purpose is injected its physiologic and therapeutic effects are produced in the fullest degree in the shortest time and in the most characteristic form. Just as the subcutaneous administration of solutions in many instances is superior to their administration by mouth, so the intravenous injection is better than the subcutaneous. Some of the advantages of intravenous medication may be stated as follows:

The dose is usually smaller (a fraction, one-half, or even less) than the amount necessary to produce an equivalent effect by the oral route.

The effect is prompt, sometimes immediate, and usually may be accurately estimated.

The patient is spared the disagreeable taste, gastric distress, and psychic effects of drugs given by the mouth, and likewise the local reaction, swelling, induration, and pain incidental to hypodermic injections are not seen after properly made intravenous injections.

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279 EDISON AVENUE.

EDITORIAL.

THE PASSING OF OLD POPULAR MIXTURES.

With the advances which have been made in our knowledge of disease and with the improvements which have taken place in pharmacy it is inevitable that, from time to time, compounds or mixtures which have been more or less popular with the profession and the laity will pass out of use. In their passing it would look as if they were going to drag down into undeserved oblivion others which the profession have long regarded as of value, and which we think the profession will adhere to even if they are no longer considered worthy by the Committee of Revision of the Pharmacopœia. In the new Pharmacopœia, which is now the authority, such old-fashioned compounds as Hoffman's Anodyne and the vegetable cathartic pill have failed of recognition. If Hoffman's Anodyne has been excluded on the ground that the heavy oil of wine which it contains is a useless ingredient the exclusion is proper, but if it has been excluded upon the basis that the compound is useless we do not think that the conclusion arrived at is correct. For a number of years we have used spirit of ether in place of compound spirit of ether with equally good results without offending the taste of the patient, as is inevitable if a compound containing the heavy oil of wine is employed.

The vegetable cathartic pill, a comparatively new combination, has apparently not been used sufficiently to justify its continuance, and, on the basis that all compounds that have not an extraordinary value should be excluded, it may well be dropped; nevertheless we think that this exclusion will encourage, rather than discourage, the employment of compound pills made by manufacturers, who, for that matter, will probably continue to make the vegetable cathartic pill even if it is no longer official.

In a recent issue of the *Journal of the American Medical Association* the editor expressed the opinion that aromatic spirit of ammonia was an old-fashioned, complex mixture, and that its reputation has little scientific basis. He thinks that whatever effect it has is probably psychic, and that such effect might be expected from the irritation of the nasal mucosa. This strikes us as being a curious form of psychic impression. It is quite true that in the dose of ½ drachm given to an adult its powers are probably not very great, but it seems to us that here we have an illustration of a statement based rather upon opinion than upon experience. Literally hundreds of thousands of persons in and out of the profession are certainly willing to testify that in the dose of a drachm, properly diluted, aromatic spirit of ammonia is a valuable agent for the relief of faintness and even certain types of fatigue, and we believe that those unfortunate individuals who suffer from heart pang of various degrees consider that aromatic spirit of ammonia is a sovereign remedy for the complete or partial relief of the distressing symptoms which they sometimes experience. If those who think that aromatic spirit of ammonia exercises only a psychic effect will take a dose of it diluted with one to two tablespoonfuls of water, we think that they will conclude that they have taken something which acts on other parts of the body than the mind.

A NOVEL METHOD OF USING ADRENALIN IN RESUSCITATION.

Ever since the physiological action of adrenalin was thoroughly comprehended it has been the custom with some medical men to employ it as a vascular stimulant in conditions of threatened or present collapse because of its powerful influence upon the muscular fibers of the blood-vessels. The readers of the GAZETTE will recall that not long ago we published an abstract of a report in which a physician having delivered a child by the Cæsarian operation from a dead mother failed to resuscitate it until the

idea occurred to him to inject adrenalin into the umbilical stump, when prompt resuscitation occurred. The difficulty with the hypodermic injecton of adrenalin is that it is so slow of absorption, and the question also arises as to whether a considerable portion of it is not altered in the subcutaneous tissues, so that by the time it enters the blood-vessels its phyiological effects are materially altered or impaired. When we come to its intravenous injection it is usually found in the patients who need it most that the vascular system is in such a condition that it is difficult to readily find and puncture a blood-vessel, the peripheral circulation having practically ceased.

Our readers will also recall that not long since we published in these pages reports of experiments made for the resuscitation of those apparently dead by the injection into the pericardial sac, through the chest wall, of various medicinal substances which possess the power of stimulating the heart muscle, and while we do not know of any instance in which this has been done in human beings, nevertheless some favorable results have been obtained in animals.

The latest contribution to the possible use of adrenalin in the presence of circulatory emergency is made to the *Journal of Experimental Medicine* of June 1, 1916, by Auer and Gates. They point out that the respiratory route for the administration of active drugs has been very largely ignored, although syphilis is sometimes treated by inhalations of sublimed mercury, and various diseases of the respiratory tract by the use of creosote and other substances in vaporized form, but the respiratory apparatus is practically never used when stimulants for the general system are required, unless we consider the inhalation of ammonia as a form of such medication, and in this instance a considerable degree of its effect is probably the result of reflex irritation rather than absorption.

To express the matter briefly, Auer and Gates found that the injection of adrenalin into the trachea results in its diffusion into the pulmonary alveoli with great rapidity and its corresponding rapid absorption. They made careful studies of the blood-pressure and other vital functions, and found that the adrenalin rapidly produced a physiological effect. The quantity which they employed varied from 0.15 to 0.03 Cc. per kilogram of body weight. Sometimes the injection was made by means of a filiform catheter introduced into the bronchus; in other instances it was directly sent into the lung tissue through the wall of the chest; and, in still other instances, directly through the walls of the trachea by means of a hypodermic needle. Although they are not prepared to present any results obtained by such intratracheal injections of adrenalin in human beings, they nevertheless conclude that such injections can be made repeatedly without harm, that prompt results in the circulatory system ensue, and that tracheotomy is not necessary, since the puncture of the trachea does not seem to be followed with evil results, particularly if the needle is attached to a piece of rubber tubing so that any sudden movement might not break off the needle as it probably would if attached directly to the syringe. We presume that the strength of the adrenalin employed is that which is now universally found on the market, namely. 1:1000. Auer and Gates are prepared, as a result of their investigations, to recommend that this plan be tried in urgent cases.

INTESTINAL PARALYSIS AND ITS TREATMENT BY PITUITRIN.

Under this title an article is contributed to the *Buffalo Medical Journal* for July, 1916, by Colton, who is physician to several of the hospitals in Buffalo, N. Y. After pointing out that intestinal paralysis is apt to be met with after a number of inflammatory and operative conditions, and drawing attention to the fact that in a certain proportion of these cases intestinal movement has become impossible because of anatomical and pathological lesions, producing mechanical difficulties, which can only be overcome by operation, he proceeds to dis-

cuss postoperative paralysis of intestinal movement and also the paralysis and distention which is met with in acute diseases like pneumonia and typhoid fever, detailing cases in which he has given pituitrin hypodermically with excellent results. He details a case with lobar pneumonia with considerable abdominal distention, a rise in pulse-rate, labored breathing, with no relief following the action of cathartics and the use of enemata. The blood-pressure rapidly dropped and the patient failed to respond to camphorated oil and strychnine given hypodermically.

Because of the very great fall in blood-pressure ½ Cc. of pituitrin was injected very slowly into the median cephalic vein. Within thirty seconds Colton states that there was the most remarkable effect he has ever witnessed from any drug, namely, expulsion of large quantities of gas and an enormous stool, the abdomen, in less than three minutes, returning to its normal size. With this a marked improvement in the action of the heart and disappearance of cyanosis took place, followed by rapid convalescence. He quotes a number of authors who have employed pituitrin for the relief of intestinal distention with success. If the pituitrin is given intramuscularly good results are said by Bidwell to ensue in about an hour, but Colton thinks that the intravenous injection produces such immediate results that this plan is preferable.

As illustrative of the value of controlling our evil results, or failures, by exploration or autopsy findings, he cites a case of cholecystectomy in which the patient did well up to the third day, when a rapid pulse and abdominal distention with no movement of the bowels ensued. The patient received 1 Cc. of pituitrin intravenously without any effect, the pulse became more rapid, and the distention greater. This forced the surgeon to a second operation, when there was found 42 inches of gangrenous gut due to embolism of the mesenteric artery. Of course, no drug however active can be expected to produce a movement in the presence of such a lesion as this.

DIARRHEA AND VOMITING IN CHILDREN.

An exhaustive research upon this subject has been contributed to the June issue of the *Quarterly Journal of Medicine* of Oxford, England, by Mellanby. It covers more than two hundred pages and involves a large amount of research in physiological chemistry in connection with matters of feeding and the elimination of various products of metabolism. We have not space in the pages of the GAZETTE to deal with the various points covered in the investigation quoted, so far as experimental methods and results are concerned. With the practical bearing of this study, however, we wish to deal.

The author starts out, as the result of experiments upon animals, by pointing out that a child suffering from an attack of acute diarrhea and vomiting has no food or water in its alimentary canal, has a deficiency of body fluids, to a greater or less degree suffers from loss of bile salts, and soon has no reserve of absorbed foodstuffs. The result of this is to permit of the absorption of toxic substances from the alimentary canal at a maximum rate; and, again, these conditions permit the absorbed toxic substances to have their maximum effect. If the weather is hot and humid the patient suffers from the depressing effects of these atmospheric conditions in addition.

Mellanby clearly recognizes that there are elements of fallacy in directing treatment in human beings from experiments made upon the lower animals, nevertheless it is quite possible that such investigations may throw light upon what is best for children. His belief is that the first and most important thing in the way of treatment is to bring the quantity of body fluids up to and beyond the normal amount, and that this should be done by rectal injection, if it can be retained, by hypodermic injection, and, in grave cases, by intravenous injection, if a vessel can be uncovered. If vomiting is not urgent as much fluid should be given by the mouth in small quantities as the

stomach will tolerate and absorb. He thinks that a small child can take as much as two ounces of water every hour with advantage, and advises for hypodermoclysis that the salt solution should be put in a thermos glass, since by this means its temperature can be kept constant.

In regard to the injection of salt solution intravenously, it is to be remembered that the presence of any pulmonary complication to a large degree contraindicates such procedure, as it may lead to pulmonary edema.

Concerning the use of castor oil, Mellanby quotes Still as recommending it in five-minim doses, because it is his belief that, in this amount, it has a constipating effect.

Concerning the use of opiates, Mellanby is distinctly opposed to them, since he believes that they tend to depress the respiratory center, and, although they may by their suppressing action check the diarrhea and vomiting, the general physical depression which they induce is disadvantageous.

He is opposed to giving children albumen-water in severe diarrhea, as he believes that, in consequence of the decomposition changes in the albumen which are liable to occur in the absence of digestive ferments and hydrochloric acid, toxic substances may be formed. And, speaking theoretically, he raises the question as to whether a 10-per-cent solution of dextrose made up with 0.5-per-cent hydrochloric acid is not the best form of food to administer. Personally, we would prefer giving whey, to which an extra amount of sugar of milk is to be added to increase its nutritive value.

ON THE VALUE OF ADRENALIN IN POLIOMYELITIS.

In the presence of a disease presenting such extraordinary difficulties in its etiology, in its diagnosis, and in its treatment as does acute poliomyelitis, the profession naturally grasps at any method which seems to give promise of saving life or arresting the progress of lesions, which in some cases, because of the deformities which result, may produce a condition which, possibly, is worse than death itself. Opinions based upon statistical reports are often sadly erroneous. The fallacy of statistics is generally recognized, and when the statistical method is applied to the treatment of disease, it is not only open to its ordinary fallacies, but, in addition, it is subject to the errors of diagnosis, to the degree of vital resistance in each individual patient, to the virulence of the infection in each case, to the part of the nervous system which is chiefly involved by the disease, and, last of all, to the length of time which the disease has existed before the method of treatment is instituted.

Up to the present moment only two methods of treatment seem to have given sufficient promise to have encouraged those of experience to pursue them still further. One of these is the injection, subcutaneous or intraspinal, of so-called immune serum derived from the blood of individuals who, at some time in the near or remote past, have suffered from this disease. So far as we know, there is little or no experimental evidence to prove that this serum contains immune bodies. Its employment is based upon analogy with other infectious diseases which produce immune bodies in the blood and with the hope that it will do good, or at least not do harm. In the hands of some practitioners its use seems to have been followed by excellent results, while, in the hands of others, it has notably failed. This plan has also been vigorously attacked by those who believe not only that it is capable of doing harm, but that it is incapable of doing good. Nevertheless, as we have already intimated, the results achieved are encouraging many men to continue its use.

Something of the same sort may be said in regard to the suggestion, first advanced by Meltzer, that intraspinal injections of adrenalin be employed, but a paper, which is of considerable interest in this connection, is published by Lewis in the *New York Medical Record* of September 23, 1916. He points out that the mortality in the city of New York has been 23.9 per

cent, whereas in 77 cases of acute poliomyelitis treated by this method 59 survived. This, to be sure, does not indicate much value in the treatment so far as the avoidance of mortality is concerned, but the treatment does seem to modify the severity of after-symptoms in those that survive. In the 59 cases which received the adrenalin treatment, and of which there is a record six to ten weeks after the onset of the disease, we find that there was complete recovery in 21, or 35.57 per cent; great improvement, with all indications that complete recovery will soon follow, in 21, or 35.57 per cent; probable permanent disability in one or more groups of muscles in 17 cases, or 28.79 per cent. These statistics are, perhaps, the more notable when we find that four of the twenty-one cases that reached complete recovery came under observation when in an extremely moribund condition, little or no hope being entertained as to their surviving. Even if it is urged that the adrenalin did them no good, it certainly did them no harm.

The method employed consists in injecting 2 Cc. of commercial adrenalin solution 1:1000 intraspinally. The injections are given every six hours, day and night, until the temperature remains normal for forty-eight hours. In order to get rid of the 0.5 per cent of chloretone, which is placed in the adrenalin solution for preservative purposes, the bottle of adrenalin, with the cork removed, is placed in a water-bath at boiling temperature for two or three minutes, and then the chloretone-free solution, undiluted, is injected. In those cases in which there was respiratory involvement it is recommended that the injections be given with the patient in the lateral prone position, for putting him face downward embarrasses the respiration and increases the cyanosis. No local anesthetic is employed. The point of election for injection is between the fourth and fifth lumbar vertebræ. Care is to be exercised that the needle does not go through the same skin puncture the second time lest infection be carried into the cerebrospinal fluid. When on the introduction of the needle the intraspinal pressure is found to be distinctly above normal it is relieved by allowing the fluid to escape before the adrenalin is injected. The fluid removed from Lewis's cases was mostly clear, and, in a few cases, opalescent. In one case it was hemorrhagic, but in this instance there was an associated meningitis caused by the Friedlander bacillus.

This method of using adrenalin has been criticized as has the method of using immune serum; nevertheless, up to the present time, as we have already stated, these two methods have been employed more widely and have given better results than any others which have been reported.

THE COMPENSATION LAWS.

There has been much speculation concerning the effect of the compensation laws as administered in the various States, not only on the workmen, the employer, and the doctor, but upon medical education and upon the standard of efficiency to which the physician and surgeon should be held.

The Pennsylvania law became operative on the first day of the present year, and applies to all men who labor and occupy the relationship of employee to employer or servant to master, with the exception of the agricultural worker, the household servant, the casual employee not engaged in the regular course of the business of the employer, and the home worker. Agitation which brought about this legislation, in its varied forms nation-wide, was on the part of organized labor, as suggested by the omission of household servants and agricultural workers. But to the credit of the employer it can be stated that the responsibility placed upon him was accepted without violent struggle and in many cases with cheerful alacrity. This suggests a growing knowledge of the fact that the health, welfare, and happiness of the employee constitutes the greatest asset of the employer.

Concerning the relation of this act to the medical profession, a patient coming under this act must be suffering from an injury by which is meant violence to the physical

structure of the body and such disease or infection as undoubtedly results therefrom. The law does not cover occupational diseases or any illness incident to the performance of labor other than what can be directly traced to the original injury received in the course of employment or because of the condition of the employers' premises. Concerning the compensation of the physician the law is thus written:

"During the first fourteen days after disability begins, the employer shall furnish reasonable surgical, medical and hospital services, medicines and supplies, as and when needed, unless the employee refuses to allow them to be furnished by the employer. The cost of such services, medicines, and supplies shall not exceed twenty-five dollars, unless a major surgical operation shall be necessary, in which case the cost shall not exceed seventy-five dollars. If the employer shall, upon application to him, refuse to furnish such services, medicines, and supplies, the employee may procure the same, and shall receive from the employer the reasonable cost thereof within the above limitations. If the employee shall refuse reasonable surgical, medical, and hospital services, medicines and supplies, tendered to him by his employer, he shall forfeit all right to compensation for any injury or any increase in his incapacity shown to have resulted from such refusal."

Further come the following regulations: "Any time after an injury the employee, if so requested by his employer, must submit himself for an examination, at some reasonable time and place, to a physician or physicians legally authorized to practice under the laws of such place, who shall be selected and paid by the employer. If the employee shall refuse, upon the request of the employer, to submit to the examination by the physician or physicians selected by the employer, the Board may, upon petition of the employer, order the employee to submit to an examination at a time and place set by it, and by the physician or physicians selected and paid by the employer; or by a physician or physicians designated by it and paid by the employer; and if the employee shall, without reasonable cause or excuse, disobey or disregard such order, he shall be deprived of his right to compensation under this article. The Board may at any time after such first examination, upon petition of the employer, order the employee to submit himself to such further examinations as it shall deem reasonable and necessary, at such times and places and by such physicians as it may designate; and, in such case, the employer shall pay the fees and expenses of the examining physician or physicians, and the reasonable traveling expenses and loss of wages incurred by the employee in order to submit himself to such examination. The refusal or neglect, without reasonable cause or excuse, of the employee to submit to such examination ordered by the Board, either before or after an agreement or award, shall deprive him of the right to compensation, under this article, during the continuance of such refusal or neglect, and the period of such neglect or refusal shall be deducted from the period during which compensation would otherwise be payable.

"The employee shall be entitled to have a physician or physicians of his own selection, to be paid by him, participate in any examination requested by his employer or ordered by the Board."

It is apparent in the first place that the working of this law insures prompt treatment for all injuries. It is to be hoped that it will be extended in its scope so that it will apply to at least occupational diseases. This immediate attention implies the prevention of infection and other sequelæ which in the past have so often been the cause of permanent crippling or even death. It is also obvious that the employer, usually a man of intelligence and of business acumen, will hold the medical profession to a far stricter accountability for neglect or incompetence which cost him money than did the subject of such neglect or incompetence in the past or any one representing him.

It also seems clear that industrial surgery and medicine must receive a more intensive study than are accorded to them, and that the successful schools will be compelled to

rapidly assimilate and impart to the future practitioners the knowledge gained by such intensive studies. Hence the effect of compensation laws, whilst beneficial to the workmen and salutary to the employer, is both directly and indirectly helpful to the medical profession and its practitioners.

Mackey (*Pennsylvania Medical Journal*, July, 1916) states that the Pennsylvania Board has approved 7500 voluntary agreements entered into by employer and employee fixing compensation, and that of the 88,220 industrial accidents which have happened in Pennsylvania since January 1, only 18,660 have compensation features, while every one of the 88,220 required medical attention at the expense of the employer. It is obvious that the employer's first act on the passing of the compensation law would be the procuring of insurance. Mackey, questioning all the great carriers licensed to write this insurance, found that fully 50 per cent of all the money paid by these carriers on account of the Workmen's Compensation law goes to physicians. Thus the doctors have been directly financially benefited by the law, their opportunities for professional engagements have been increased, and they have secured prompt payment of their fees. It should be remembered that the purpose of the law is to assist industrial workers, and even if this involves some sacrifice the medical profession should be willing and very glad to do their part to secure the great benefits which must accrue to the army of wage workers.

In the majority of States it is compulsory upon the employee to accept the physician whom the employer chooses to send. In Massachusetts, for instance, if an employee desires a doctor or a hospital other than that provided by his employer he must pay. Actually the Industrial Accident Board has worked out a middle course which, under reasonable regulations, permits free choice.

In Pennsylvania from January 1 to May 10, 1916, there were more than 800 working men and women who lost their lives in the course of their employment.

Van Sickle states that the Workman's Compensation laws are here to stay. "They are of immense benefit to the industrial community when properly drawn and properly applied. To the medical profession, from the point of affecting the physicians' recompense, they have the advantage of certainty of payment, a fair degree of continued service throughout the year, offering an opportunity to take industrial accident work and at the same time carry on the usual every-day practice, especially in smaller communities where not under specific contract by corporations. This method of compensation under industrial laws tends to offer the opportunity to specialize and become more proficient on the part of those desiring to undertake this class of work.

"A better understanding of the law in each individual State, under which the physicians and surgeons are working, will have a tendency to make possible a better compliance with the law, and, as a result, establish harmonious work between the commission or board applying the law and the physicians of that State. Wherever unity among the physicians of the State is established, legislative coöperation must and will be brought about."

REPORTS ON THERAPEUTIC PROGRESS.

AN INVESTIGATION OF THE BEST METHODS OF DESTROYING LICE AND OTHER BODY VERMIN.

KINLOCH in the *British Medical Journal* of June 3, 1916, reaches these conclusions:

1. As Bacot has shown, and as the writer's later experiments also demonstrate, lice do not survive immersion in boiling water.

2. Several insecticidal powders have been tested, and of these naphthalene, creosote and iodoform powder is the most destructive to lice.

3. Of the three constituents of N. C. I. powder, naphthalene and creosote have each a strong insecticidal action. The insecticidal action of iodoform is feeble.

4. Naphthalene appears, so far as Kinloch's comparative tests have gone, to be the most suitable basis for use in the preparation of a powder destructive to lice. Commercial naphthalene is more actively insecticidal than pure naphthalene, and it appears that the lethal power of naphthalene for lice is dependent in great part on the presence of hydrocarbons and coal-tar derivatives other than pure naphthalene.

5. The immediate lethal effect of creosote when mixed with naphthalene is less than that of some other insecticidal liquids, but the longer period during which creosote continues to act more than compensates for the initial disadvantage.

6. In addition to its feeble insecticidal activity, iodoform greatly increases the adhesiveness of N. C. I. powder for cloth. The inclusion of iodoform in the powder is accordingly justified, although similar adhesiveness of the powder is obtainable at less cost by substituting the insecticidally inert but cheaper magnesium silicate for iodoform in the powder.

7. The insecticidal power of naphthalene-creosote powders gradually diminishes when they are exposed in the open air.

8. The moist nature of such powders precludes their being used successfully in perforated tins, and it has not been possible to dry the powders and at the same time retain the moist and volatile hydrocarbons and other coal-tar derivatives on which the insecticidal effect mainly depends.

GANGRENE OF THE LUNG FOLLOWING ARTIFICIAL PNEUMOTHORAX.

In the *American Journal of the Medical Sciences* for June, 1916, PACKARD writes on this topic and reports a death from this treatment. He thinks the following sequence of events may have occurred:

1. To begin with there was a rapidly disintegrating lung with superficial cavities.

2. More or less extensive necrosis of lung tissue due to obliterative endarteritis.

3. The introduction of gas collapsed the lung, limiting the blood supply, and thus aiding in the extension of the necrosis.

4. Putrefaction now took place and gangrene supervened upon the necrotic area.

5. Rupture of the lung then followed and the pleural fluid became putrid and corroding.

Putrefactive organisms and large necrotic areas are frequently present in tuberculous lungs and do not produce gangrene. There is no reason to suppose that had this lung been left alone it would have become gangrenous. It would appear that the collapsing of the lung was the immediate exciter of the subsequent events.

Other lungs in a similar condition have been collapsed without bad results, but evidently such a procedure is fraught with danger.

INTRASPINAL INJECTIONS OF BICHLORIDE OF MERCURY.

In the *Boston Medical and Surgical Journal* of June 1, 1916, HUNT states that at a recent meeting of the section on medicine of the New York Academy of Medicine he reported forty cases of spinal syphilis which had been treated by the intraspinous administration of mercurialized serum, and five cases which had been treated by the direct intraspinous injection

of bichloride of mercury. The forty cases he was able to give fairly definite reports on, and recited some conclusions. Since then he has treated twelve additional cases by the direct administration of bichloride of mercury into the spinal fluid.

The method of administration was as follows: Weigh out one gramme of Merck's bichloride of mercury; dissolve this in 770 Cc. of distilled water; sterilize the whole. One cubic centimeter of this solution contains .0013 gramme of bichloride of mercury, which is equal to 1/50 of a grain. Draw off 15 Cc. of spinal fluid; discard 5 Cc., and to the remaining 10 Cc. add 1 Cc. of the bichloride solution previously prepared. Then reinject directly into the spinal canal, very slowly, the whole 11 Cc. The time consumed in performing this reinjection should be about four minutes. To minimize the handling of the solution and so decrease the chances of infection, it is best to draw the 1 Cc. of the bichloride solution directly into the syringe, and mix the two solutions there in the hypodermic. Then reinject the entire 11 Cc. The patient should then be put back to bed, and for the first five or six hours the foot of the bed should be elevated. This precaution is taken in order to diminish the tendency of the patient to acquire a headache.

The twelve treated cases all come under the head of syphilis of the nervous system. They consisted of general paresis, tabes, taboparesis, hemiplegia, optic nerve atrophy, and one case of brain syphilis with complicating hemiplegia. These cases were given either 1/64 or 1/50 of a grain of bichloride of mercury at each intraspinous injection. The usual plan was to give 1/64 at the first dose, and then 1/50 at subsequent doses. In a few cases, however, the maximum dose of 1/50 was given at the beginning. The injections were approximately at intervals of two weeks; in a few instances it was not possible to give them exactly on the day, but an effort was made to have the dosage as nearly as possible every fifteen days. All of these patients were at the same time being given a mixed antisyphilitic treatment—that is to say, potassium iodide by mouth, and on the alternate weeks hypodermic injections of the salicylate of mercury, of a grain or less.

In a few of these patients it was not possible to obtain definite results, but in the large majority improvement was manifest. The reaction was nearly always present, of varying extent. In some the pains became very severe, lasting two or three days; in others the shooting pains in the legs were moderately increased for a few hours. In a very few of the cases there was persistent after-vomiting. In one there was very marked involvement of the sphincters. This patient lost control of his bladder for three weeks, and of his intestinal tract for two weeks. He is, however, growing stronger, and there is every indication that in time he will control both functions.

The conclusions which Hunt reaches in the twelve cases reported are neither final nor conclusive. He fully realizes that the number of cases is not sufficient, and that the time in which they were followed is not long, nor were a sufficient number of intraspinous injections administered. However, the conclusions drawn were as follows:

1. The spinal fluid Wassermann remained unchanged even after three or four treatments.

2. The globulin did not undergo much, if any, change; occasionally a ++ became a +.

3. The reaction after the treatment was usually not severe, and generally amounted to shooting pains in the legs of marked severity.

4. There was always a possibility of getting a considerable degree of rectal or bladder sphincter disturbance, which was, however, temporary.

5. The cell count was almost always lowered.

6. The shooting pains in the legs were almost invariably relieved.

In other words, the administration of bichloride of mercury directly into the spinal fluid gives practically the same results as the administration of mercurialized serum. It has the advantage over the latter of simpler technique, shorter methods, and easier

administration, with less opportunity of infection. The great advantage, to the writer's mind, lies in the fact that the operation is simpler, and there is less involvement on the part of the laboratory. Both methods, that of the mercurialized serum and that of the bichloride directly injected into the spinal fluid, can be considered as valuable substitutes for the administration of salvarsan. Whether the results will be as permanent as the latter remain to be seen.

It is certainly fair to say that no ill results can accrue from the direct intraspinous injection of 1/50 of a grain of bichloride of mercury in syphilis of the nervous system.

It is well to make the initial dose small; it is therefore better to begin with a dosage of 1/64 of a grain and later increase it to 1/50.

In no instance was any change manifest in the reflexes, but change was evident in tremors, in the pains, in the spinal fluid content, and especially in the general condition of the patient. There is no doubt that any of these injections—salvarsan, mercurialized serum, or bichloride of mercury—have a very good moral effect on these patients, and for that reason alone should be encouraged.

THE EPIFASCIAL METHOD OF INJECTING MERCURY AND SALVARSAN DERIVATIVES.

Wolbarst in the *Medical Record* of June 3, 1916, in writing on this subject states, as regards the epifascial injection of mercury, that it is his belief that this method has a distinct field of usefulness and is a decided improvement over the purely intramuscular method of administration.

First, as regards absorption: It would appear that the solution or suspension (depending on which form of mercury is being used) is absorbed with the same readiness in this method as in the intramuscular injection. If there has been any failure of absorption resulting in encapsulation and infiltration, he has not observed a single evidence of that occurrence. In not a single instance has infiltration or necrosis developed, nor has there been any evidence of localized inflammation at any time.

From the standpoint of pain the matter cannot be dismissed so readily, for the personal equation enters largely into this subject. Some injections have been absolutely painless—about 20 per cent; many have been painful for a day or a part of a day—about 60 per cent; the remainder, about 20 per cent, have suffered more or less severe pain for periods varying from one day to two or three weeks, the pain increasing for about two days and gradually diminishing.

The medium employed for the injection seems to have no bearing on the element of pain in these cases. In some cases mercury salicylate administered epifascially gave no pain whatever; in other cases pain was severe and lasted several days. The soluble preparations reacted to pain in the same uncertain way; one can never tell whether a particular pateint is going to suffer pain or have no pain at all. Nor is there any way of telling where the pain is going to be felt. Most patients feel the pain about two inches below the point of injection, but as the patient assumes the erect position in walking about, the fluid seeks its lowest level and thereby causes the pain at that point, and not at the immediate site of the injection. One of Wolbarst's patients, a rather fleshy woman, never felt the pain in the buttock at all; four or five hours after an epifascial injection, when the effect of the local anesthetic had passed off, she began to feel a more or less severe pain running down the thigh along the course of the sciatic nerve, the pain sometimes extending down to the toes and making it uncomfortable, and even impossible, to wear a tight shoe. Whatever spot was chosen for the injection in this patient, the pain was sure to be felt along the course of the nerve, but never at the immediate site of the injection. In quite a large proportion of cases the pain was felt in the thigh at some point distant from the site of injection, and in most of these the pain apparently ran along the course of the sciatic nerve.

The technique of the epifascial injection

is not difficult once it is mastered. It is peculiarly difficult to describe. It is based on the theory that medication fluid injected in proximity to the layers of the fascia lata will be less painful and cause less inflammation with equal absorption than when deposited in and between the muscle fibers. The success of the technique depends on the surgeon's ability to determine whether the point of his needle is in proximity with the deep fascia or simply in the muscle proper of the buttock. Experience with the method gives an amount of information which cannot be imparted in words. The needle is plunged into the gluteal muscle as in the intramuscular method; it is then manipulated until the hand feels that the needle point is moving freely from side to side, and is not being impeded by muscle fiber. When that sense of free motion of the needle point is felt, the surgeon may be certain that the point is in proximity with the deep fascia. Any doubts on this score may be cleared up easily by the simple expedient of injecting ten to fifteen drops of sterile water, saline solution, or, better still, a local anesthetic solution, and withdrawing the syringe but not the needle. If the eye of the needle is epifascial, there will be a steady flow of the injected fluid, drop by drop, from the needle; if, however, the needle point is in the muscle tissue, there will be no flow of fluid. In that event the needle is manipulated—*i.e.,* pushed in deeper or pulled out further, until such a point is reached where the injected fluid issues steadily from the needle. Wolbarst then proceeds with the injection.

Recalling the anatomy of the buttock with reference to the fascia lata, we find that the fascia lata passes down from its attachment to the iliac crest over the gluteus medias to the upper border of the gluteus maximus, where it splits in two layers, one passing above and the other passing below the fibers of the latter muscle. At its lower border the two layers unite to form one layer again. It is therefore evident that any point on the side of the buttock, the pateint lying flat on the table, face downwards, will bring the injected fluid in contact with the fascia. The needle is plunged in horizontally—that is, at right angles to the side of the buttock. Wolbarst finds a needle about 1¼ to 1½ inches long is most suitable for this purpose.

As previously stated, a local anesthetic fluid may be used to determine whether the point of the needle is epifascial or intramuscular. This serves the double purpose of giving us the information that the needle is properly placed, and also of making the injection proper absolutely painless. Wolbarst has injected neosalvarsan and mercury epifascially without the slightest sensation of discomfort or pain, by the employment in this manner of a local anesthetic, such as 2-per-cent alypin or novocaine. Not more than ten to fifteen drops are needed to anesthetize the site of the injection. This freedom from pain is, of course, but temporary, like all local anesthetic effects, but the step has the double advantage already indicated above.

The epifascial technique requires the employment of a needle and two syringes for its best results, though one is sufficient for practical purposes. The needle having been plunged into the buttock, the first syringe, holding ten to fifteen minims of anesthetic solution, is attached and the fluid deposited epifascially; this syringe is now detached from the needle, which is meanwhile held steadily in place so as to prevent its moving, and the second syringe containing the medication fluid is now attached and the process completed. Wolbarst thinks this method is one that offers a distinct improvement on the intramuscular method and is worthy of further study and attention.

THE THERAPEUTIC POSSIBILITIES OF ANTITETANUS SERUM.

The *American Journal of the Medical Sciences* for June, 1916, contains an article by ROBERTSON in which he reminds us that early in his work on tetanus antitoxin, Behring recognized the theoretical advantages of intravenous injections, but he exhibited a distinct hesitancy toward giving this method his unqualified indorse-

ment. This hesitancy evidently, in part at least, proceeded from a fear of the dangers incident to the injection of a foreign serum into the body and a belief that these dangers were more threatening with intravascular than with subcutaneous administration. It is true that with extensive use of diphtheria antitoxin, cases of "serum Krankheit" became fairly common, and in a small percentage of cases threatening symptoms of asphyxia and even death followed its use. While, however, the occurrence of urticaria and other skin phenomena, following the administration of tetanus antitoxin, is well known, there are, so far as Robertson has been able to find, very few records of "serum death" which really resulted from its use. Not only has the work on anaphylaxis or proteid reactions shown that there is little difference to be observed as regards the method of injecting the foreign proteid, but with the present purification and concentration of modern antitoxic serums this danger has been reduced to a negligible minimum.

On the contrary the subcutaneous method has met with much more favor from the clinical world, and largely because of its simplicity and ease it may be said to-day to be the one most usually employed. It should be distinctly emphasized that for therapeutic or curative purposes—*i.e.*, after symptoms have appeared—this method is a useless and irrational waste of precious time. All local subcutaneous injections of antitoxin are ably fully to protect the local area from toxin. But the main purpose is not to protect the local area, but to reach the toxin circulating in the blood.

Robertson proposes, therefore, that every case in which symptoms of tetanus appear be treated at once, without delay, with an intravenous injection of 3000 units of antitetanus serum. The "at once" should be emphasized. Even the saving of minutes of time may mean the difference between life and death of the patient. The experiments of Donitz and others show with what exceeding rapidity toxin travels in the body and how soon it passes in part beyond the reach of all antitoxin. It is not believed that by this or any other known therapeutic procedure the lives of all or even of any large proportion of tetanus patients can be saved. Prophylaxis is, as has been shown, the only means known at present which can bring the death-rate in tetanus to anywhere near the zero point. It is desired here merely to emphasize that by this method every patient who exhibits the symptoms of tetanus is given the best possible opportunity of preserving his life. Difficult or dangerous surgical operations, such as the intracerebral method or intralumbar injection, need not be considered; the loss of time and local pain of subcutaneous injections are avoided, and, what is of less theoretical but nevertheless often of more practical serious moment, the use of large amounts of serum obviated. The method consists simply in the immediate insertion of 3000 units of antitoxic serum into one of the veins of the elbow.

Furthermore it is of little or no value to repeat this dose twice a day or every other day, or, in the large majority of cases, at all. The one injection of 3000 units is amply sufficient to neutralize the toxin which might be elaborated and absorbed from any ordinary tetanus infection, and this antitoxin will remain effective in the blood stream for at least one week—*i.e.*, long enough to decide the issue in almost all cases of human tetanus. If the case should become chronic or suffer a recurrence, or any other special condition should develop which might indicate the advisability of giving more antitoxin, there can be no objection to a second or even a third dose; but here again it should be emphasized that a small dose is fully as effective as a large one, and a large dose is as unjustifiable the second time as it was the first.

In conclusion, Robertson would like to be certain that undue emphasis shall not be placed upon the element of dosage. The proposal is that as soon as symptoms of tetanus have appeared, 3000 units of antitetanus serum should be injected at once into the circulation. The immediate intra-

vascular injection is the important feature and the amount of the dose a purely secondary matter. Personally, he is fully convinced, for reasons which cannot be discussed here, that one-half this amount would be as efficacious. Twice this dose, however, can do no harm. The main stress is here laid upon the recognition of the theoretical considerations which underlie the therapeutic application of antitetanus serum and a rational modus operandi based upon these principles.

Naturally the complete treatment of the disease involves the application of many other measures the consideration of which does not come within the scope of this paper, but will be fully discussed in a later article.

THE TREATMENT OF HEPATIC FAILURE IN YELLOW FEVER, MALARIA, AND OTHER CONDITIONS: A SUGGESTION.

BALFOUR in the *Lancet* of May 20, 1916, publishes a paper with this title. He asks the question, What are the symptoms associated with the destruction of liver cells? They are chiefly of cerebral origin, pointing to a poisoning of the higher nerve centers. The patient begins to grow restless, watchful, excited, anxious, and light-headed. He complains of severe headache, and, it may be, of photophobia. He wanders in his mind and suffers from an incoherency of ideas and from hallucinations. His muscles twitch and tremble and delirium ensues. It may be of a low, muttering type, or may become active, the patient trying to get out of bed, but it is not usually very violent, for there is great weakness. Convulsions may set in, and if cardiac or respiratory failure does not occur coma ends the scene. In addition, Balfour finds that if jaundice is already present it deepens, while hiccough, clammy sweats, and anuria are not infrequent.

It will be found that these symptoms are common to delayed chloroform poisoning, yellow fever, severe cases of epidemic jaundice, the so-called Mediterranean yellow fever, Weil's disease, whatever that may be, blackwater fever, certain forms of fatal malaria, acute yellow atrophy, phosphorus poisoning, etc.

All this is well known, but confining himself to the tropical diseases, it would seem that these symptoms have been vaguely attributed to the action of the toxins of the virus causing the disease and that little or no attempt has been made to treat the serious liver condition which is present. It is true that in yellow fever a lessening of the urea function of the hepatic cells and resulting ammoniemia with its toxic cerebral effects has been recognized, and we are advised to dilute the toxins in the blood and to stimulate the action of the kidneys by an alkaline treatment such as that of Sternberg. This treatment has the further benefit of counteracting the blood acidosis which is present in these cases, and which may be recognized by the occurrence of acetonuria. It is noteworthy that Burkitt has quite recently treated with success cases of blackwater fever by means of intravenous injections of calcium chloride and either potassium or sodium bicarbonate. By this means he combats the diminished blood alkalinity, for the urine in blackwater cases contains acetone. The acidosis, of which it is the expression, is due to the fatty acids being poured into the blood owing to the disordered hepatic condition, and the above line of treatment is undoubtedly based on sound principles. The object of this note, however, is to suggest that we may go further and, on the lines indicated by Colonel Hunter in cases of toxemic jaundice, etc., endeavor to prevent or at least cut short the rapid destruction of liver cells which, it seems to Balfour, plays so important a part in bringing about a fatal issue in such diseases as yellow fever and bilious remittent fever.

It is necessary briefly to consider how this destruction is brought about. Colonel Hunter's views are fully set forth in Allbutt's "System of Medicine," vol. iv, part 1. He believes that in such diseases the antitoxic functions which the liver cells discharge in relation to the portal blood are first of all depressed and then suppressed by the poisons generated by the disease

viruses. Strain is thrown on the liver cell. It endeavors to maintain its energy by taking up carbohydrate material. If sufficient cannot be obtained from sugar it turns to the fat, and when this also fails to yield the supply, to tissue proteins. There is thus increased fat metabolism with acidosis and acetonuria, and the liver cell, coming under the influence of its own ferments, undergoes autolysis and thus presents the characteristic appearances seen post mortem. Colonel Hunter further thinks that ammonia, as a rule, keeps the ferments in check, and that the practice, common alike before operations and in the early stages of febrile diseases, of purging the patient with calomel and of withholding food, prevents the formation of ammonia and thus the hepatic ferments have full play. As already stated, the liver cells being thus thrown out of action fail to deal with the poisonous portal blood. The latter passes unchanged into the general circulation and the characteristic cerebral symptoms result.

Balfour is aware that Colonel Hunter's views have not met with acceptance in all quarters, and that the precise manner in which the disease toxins act on the liver cells has not been ascertained. It may, as has been suggested, be a neutralizing action upon antiferments which, quite apart from any question of ammonia, normally preserve the hepatic cells from self-digestion. All these questions require further elucidation, but Colonel Hunter's theory and researches have certainly led to one important practical conclusion—*i.e.*, the necessity in cases of delayed chloroform poisoning and toxemic jaundice of keeping up the supply both of sugar and protein food, the latter in peptonized form. The former is insured by the administration of glucose. It can be given by the mouth or as rectal enemata, solutions of 5 or 10 per cent being used. If pure glucose cannot be obtained, preserved (candied) fruits may be given, or, indeed, sugar in any form. The necessity for protein is met by administering enemata of peptonized beef-tea, eggs, or other protein material.

So far as Balfour knows, this line of treatment has not been tried in those tropical diseases in which hemohepatogenous jaundice is a marked and important feature, and it is with the object of directing attention to the advisability of employing it that he submits these few notes. They make no claim to any originality, but merely voice a suggestion which he trusts may prove useful, for the treatment of yellow fever and other tropical diseases in which liver failure occurs is at present far from satisfactory.

COMMON COLDS.

SMART in the *Virginia Medical Semi-Monthly* of May 26, 1916, states that the routine that he follows in cases in which he has reason to fear sinus trouble is, in addition to the constitutional treatment, to prescribe a powder containing 1 grain of menthol, 2 grains of bicarbonate of soda, 3 grains of light magnesium carbonate, 4 grains of cocaine hydrochloride, and a drachm and a half of milk-sugar. A little of this is to be snuffed up each nostril often enough to keep it open and clear, but in no case oftener than every two hours. There is little danger of contracting a fondness for the cocaine as most of it is washed out in the secretions. He has prescribed it a number of times and has never known of a patient using more than a half bottle in the course of one cold (except in hay-fever), so that they get only about two grains of cocaine in the whole treatment.

Smart also has them irrigate the nose with a teaspoonful each of salt and soda in a quart of warm water two or three times a day, using a fountain syringe placed not over two feet above the head. This is a safe and fairly satisfactory pressure. [Some rhinologists disapprove of this.—ED.]

Another thing Smart has found valuable for increasing the comfort of the patient as well as lessening the secretions, is the administration of tablets containing atropine and camphor, the so-called rhinitis or coryza tablets. Personally, he prefers the formula of Dr. S. MacCuen Smith, which

contains 1/600 of a grain of atropine and ¼ of a grain of camphor, besides several other ingredients of less importance. He has them take two every three hours until the patient notices an uncomfortable dryness in the throat or a palpitation of the heart.

Another thing that we are not careful enough about is instructing our patients how to blow the nose and how not to blow it. Of course we all know the dangers of trying to blow while holding both nostrils tight, but the average patient does not realize them, and he seems to take pride in the volume of sound produced, blissfully ignorant of the risk he is running of infecting his ears.

To summarize:

Every case of cold is a potential case of serious sinus or ear trouble.

Early recognition and treatment of these complications is of the utmost importance.

As the onset of these complications is often very insidious, it is highly improbable that a patient left to his own devices will recognize the presence of any serious trouble until the time has passed when the disease would be most amenable to appropriate treatment.

Therefore, the physician, even though he may not deem it necessary to treat the primary cold, is not fulfilling his whole duty if he fails to keep him under observation until the cold is a thing of the past.

NITROUS OXIDE ANALGESIA IN OBSTETRICS.

HEANEY states in the *Medical Record* of June 3, 1916, that with a proper machine nitrous oxide may be so given that a patient is oblivious to pain yet maintains consciousness and coördination. The quantity of gas necessary to produce this state varies with the individual; some require much, others quickly pass from the equilibrium of analgesia into anesthesia. In order to produce a more stable equilibrium, oxygen is mixed with the gas so that the concentration of the nitrous oxide may be varied to suit the individual as well as the changing character of her pains. The more susceptible the individual, the more apt she is to become cyanotic and unconscious, the greater the percentage of oxygen necessary in the mixture.

A few pains will show what mixture is best for a given case. When the mixture is right, two to three quick inhalations at the beginning of a contraction are sufficient to prevent the contraction being felt, and the patient's normal color and consciousness are preserved; she can bear down when directed and can follow every command of the attending physician. If the mixture is too rich, the patient becomes cyanotic or anesthetized and has confusing dreams. No physical harm results from slight excursions into anesthesia, except that if the expulsive stage is on the patient cannot give the very necessary help which is so characteristic of the proper stage of analgesia. When giving gas for the first time, the tendency is to give more than necessary; with familiarity, much less gas is used.

The administration may be begun at any time. Usually this is left to the inclination of the patient. As soon as she feels inconvenienced by the strength of her pains she makes the fact known, and the analgesia is started. It is rarely asked for before the first stage is well advanced; oftentimes not until dilatation is complete. The A. C. Clark Company has placed a trigger valve next to the inhaler, and since their gas machine is equipped with automatic regulators controlling the gas pressure, the patient may administer her own analgesia during the early stages of labor, the indicators being set for a constant mixture of gas and oxygen. In the event that she should pass beyond the analgesic zone the hand relaxes and the valve closes. With the approach of her next pain she applies the inhaler, presses down the valve, inhales, and the gas flow is started again. As labor advances it is necessary that the physician be in attendance.

Normally the uterus begins to contract several seconds before the patient perceives pain. If, when the attendant palpates the approaching uterine contraction, he places the inhaler in position and directs the pa-

tient to take the necessary number of inhalations determined as necessary in her case, she is well within the analgesic zone by the time the contraction would ordinarily be producing pain. If the labor is in the second stage, the patient is then directed to hold her breath and to bear down, and to pull upon the straps provided for the purpose. After the maximum effort is expended, she is directed to take another deep breath or two and to again bear down. The usual second-degree pain is such that it is divided into three or four expulsive efforts. The first inhalations are usually pure nitrous oxide, while each subsequent inhalation is of a more diluted mixture, the degree of dilution varying in each case and at different periods during the same labor. When the uterus is felt in beginning relaxation, the mask is removed, and the hand is placed upon the abdomen to anticipate the next pain. If the administration of the gas is delayed each time until the patient herself feels the pain, the result will be decreased pain instead of painless.

High-strung individuals with keen perceptive qualities sometimes suffer pain before the attendant can detect that the uterus is contracting. In such cases occasionally we have to administer a light continuous analgesia, if the patient is in the second stage, or administer a dose of chloral if in the first stage, to decrease the keenness of perception.

Nitrous oxide analgesia does not lessen the frequency or the intensity of uterine contractions, so that if for any reason it is deemed that the birth is advancing too rapidly, ether may be mixed with the gas or substituted for it. When the pains are again satisfactory, the ether is stopped and nitrous oxide resumed. As the head passes over the perineum occasionally the gas must be administered to the anesthetic degree, though usually analgesia is entirely sufficient.

The heart tones of the mother and child are unaltered by nitrous oxide analgesia, so that the criteria to the well-being of the child are uninfluenced by the fact that the mother is receiving nitrous oxide.

The child cries immediately upon birth, since its dose of gas is as evanescent in its action as is the mother's. The mother is in full control of her faculties within a minute or two after delivery, and suffers no inconvenience from her analgesia.

There is no relaxation of the uterus, and, providing ether has not been used, the third stage terminates as promptly and as satisfactorily as when no anesthetic is given. The perineum may be repaired under analgesia or in a deeper stage of anesthesia, as the occasion demands.

THE TREATMENT OF MUSCULAR RHEUMATISM.

In the *New York Medical Journal* of May 27, 1916, CHENEY reminds us that at the present time the most popular and most promising theory in all of these chronic ailments known as muscular rheumatism is that of local infection. This means that somewhere in the body, in every such case, there is a source from which toxins or microörganisms themselves constantly enter the blood and continue to exert an influence upon various parts of the body, particularly upon muscle tissue and joints. This theory, put forward particularly by Billings, calls attention to tonsils, gums, carious roots of teeth, or sinuses about the face; prostate gland or Fallopian tubes; gall-bladder, appendix, or large intestine, as possible sites of infection, which must be sought for and eliminated as a rational first step toward the cure of chronic muscular rheumatism as well as arthritic affections. There can be no doubt about the importance of this factor in etiology, or the value of its discovery and removal in therapeutics. Too many observations have already been made in the matter, by numerous men, to permit of skepticism. The removal of diseased tonsils; the cure of pyorrhea; the discovery, by ordinary exploration or by *x*-ray films, of abscesses at teeth roots, and their eradication; the surgical drainage of infected sinuses; the repeated stripping of prostate glands containing infected secretions; or the removal

of diseased tubes, gall-bladders, or appendices—all have been reported as resulting almost magically in the relief of persistent, painful, and incapacitating affections of muscles. As regards the intestinal tract, disinfection by overcoming stasis, by laxatives, by diet proper in quality and quantity, and particularly by the use of cultures of the Bulgarian bacillus, has likewise in certain cases proved highly effective in the treatment of chronic muscular rheumatism. All these methods are rational because they are based upon a proved etiology, and will probably be more and more the first thought, as time goes by, to the exclusion, or at least to the great diminution, of the older methods.

THE TREATMENT OF TUBERCULOUS ADENITIS BY ROENTGEN RAYS.

Writing in the *New York Medical Journal* of May 27, 1916, BOGGS asserts that different authorities call attention to the fact that when medical treatment of tuberculous adenitis alone is adopted, from twenty to twenty-five per cent of the patients ultimately acquire pulmonary tuberculosis. The medical measures can be continued in conjunction with the Roentgen rays. Enlarged glands due to an inflammatory process are frequently secondary to a septic condition elsewhere, and search should be made for the primary lesion. When this is found and treated, if the glands remain large and particularly if they show a tendency to suppurate, the Roentgen rays are indicated. If they are given promptly and properly, suppuration can usually be avoided. Boggs does not favor opening a tuberculous mass as soon as it begins to soften, as many advocate. A few Roentgen exposures given first greatly facilitate repair of the parts, and the sinus which follows will not be so deep and will heal up more rapidly. Certainly nothing is slower in healing than a sinus leading into a gland which has been opened just as suppuration was beginning. It is a well-known fact that we have no better treatment than the Roentgen rays for carbuncles, boils, or any of the localized pus infections. How readily and promptly is pustular acne cured by the Roentgen rays! Then why be in such haste to open a tuberculous gland before it begins to bulge? Under Roentgen treatment they are never painful.

In conclusion, radiotherapy stands in a different place than it did two years ago. The flexibility of the Coolidge tube makes it possible to give treatment more accurately, and by diminishing the tube trouble so many exposures are not necessary. The same massive radiation is not indicated in the treatment of tuberculous adenitis as in the treatment of malignant disease. It is much better to lengthen the exposures, and not to attempt to cure the patient with one or two massive doses, because we want to produce a constitutional improvement as well as a disappearance of the enlarged glands. No matter how wonderful the result, the patient should have good hygienic surroundings and not attempt work which is too strenuous, for a time at least.

The Roentgen ray is the best method of treatment when the glands have become widely scattered and are broken down. Where there is pulmonary involvement, Boggs believes the Roentgen ray, together with good hygienic treatment, is the only method to be considered. Early thorough operation cannot remove all tubercle bacilli which have invaded some of the smaller glands. When the Roentgen rays are employed early, suppuration seldom occurs. This treatment avoids sinus formation and disfigurement.

Prophylactic treatment is important, and has not received proper attention. Persons having unhealthy tonsils, adenoids, nasopharyngeal catarrh, bad teeth, etc., are predisposed to tuberculous adenitis. Until recently very little attention was paid to the source of infection. An effort should always be made to locate the channels of infection, although a great many cases are cured without finding the primary focus. Surgery is valuable and necessary, but when adenitis is treated by the Roentgen rays, it can be limited to from five to ten per cent of the cases.

RECURRENCE OF SYMPTOMS AFTER OPERATION FOR GALL-STONE DISEASE.

In the *Official Bulletin of the Chicago Medical Society* of May 31, 1916, we are told that DEAVER read a paper on this subject, in which he stated that during the period from January 1, 1910, to January 1, 1916, there were performed at the German Hospital 1031 operations upon the gall-bladder or biliary passages, with a total mortality of 7.18 per cent, or 74 deaths.

During the same period, and included in the above, there were 42 cases that had been operated upon previously for the same disease. Five of these had had two previous operations, and one had been operated upon three times without relief. The number of operations performed upon these 42 cases was 50. The operative mortality in this group was exactly 8 per cent, or approximately the same as in the whole series. The four fatalities were due, in one case, to uncontrollable hemorrhage, in another to the same cause plus leakage from a cholecystoduodenostomy, in the third from toxemia and exhaustion, and in the fourth, which was the case mentioned as having had four operations, death was due to acute pancreatitis in addition to carcinoma of the head of that organ. A considerable number of these recurrent cases had not been operated upon by him in the first instance, but he had no doubt that some of his original cases had reached the hands of others of his colleagues for secondary operations, so that it seemed likely that under the present conditions of surgery prevailing in this period about four per cent of all cases come to reoperation for persistence of recurrence of symptoms. The average interval between the first and second operation was twenty-two months, the longest period being nine years.

Twenty-two cases, or slightly more than half, were found to have one or more stones in different locations. In eleven cases, or exactly one-half the total number, the stone or stones were in the common duct, and in one case each they were found in the hepatic and common duct, in the cystic duct, and in the hepatic duct. In the cases showing stones in one or more of the ducts, it seems altogether probable that they were overlooked at the original operation, or possibly in the case of those in the hepatic duct they were beyond the possibility of surgical removal at that time. In three cases a single stone was found in the gall-bladder. One cannot say whether these single concretions were formed after operation or were overlooked. In the other eight cases of stones in the gall-bladder the number ranged from five to several hundred, and in several cases the conclusion was irresistible that they had reformed in that location.

From these cases it would appear that gall-stones are the most common cause of the recurrence or persistence of symptoms after operation. They make their presence known within a year and often within a few days or weeks. They are usually stones that have been overlooked or out of reach, but if the gall-bladder has been left, the possibility of reformation of the stones cannot be disregarded.

In the eight cases the cause of later trouble was either failure to dislodge the infection or a reinfection of the biliary passages and pancreas. Chronic and acute cholecystitis without stones was found in three instances and pancreatitis in five.

As to the type of operation predisposing to recurrences, it is evident that more recurrence took place after simple drainage of the gall-bladder than when it was removed. Thus, in half of the stone cases recurrence was due to calculi left or reformed in the gall-bladder. In one case stones were impacted in the cystic duct and would have been removed by cholecystectomy. When stones are overlooked in the common or hepatic duct, it is, of course, clear that the treatment of the gall-bladder is of no moment so far as subsequent obstructive symptoms are concerned In the eight cases noted as simple infective recurrences, namely, cholecystitis and chronic pancreatitis, the gall-bladder had been removed in only one. Naturally cholecystitis cannot occur in the absence of

the gall-bladder, but in the five cases of pancreatitis only one had had a cholecystectomy. This is in line with the newer ideas of the part played by the gall-bladder as a chronic focus of infection from which the pancreas is often involved, and while the number of cases is small they serve to support the idea that unless it is needed for side-tracking purposes, it is better to remove the diseased gall-bladder when complicated by pancreatitis.

The superiority of cholecystectomy in respect to the freedom from recurrences is rather more than counterbalanced by the higher mortality of the operation.

The causes of recurrent symptoms following operation for gall-stone disease are the following: Late operation and extensive pathology; type of operation not adapted to the lesion; overlooking stones in the gall-bladder or ducts; reformation of stones; persistence or recurrence of infection of gall-bladder, ducts, or pancreas; insufficient drainage; adhesions, especially adherent duodenum, pylorus, or stomach; internal biliary fistula; external biliary fistula; contraction of papilla of Vater; stricture of the hepatic duct; chronic pancreatitis; pancreatic lymphangitis and interstitial pancreatitis.

The type of operation done must necessarily influence the result; for example, draining the gall-bladder when it should be removed, or *vice versa;* draining the gall-bladder externally when it should be drained into the duodenum; failure to drain when there is present a cholangitis, a pancreatic lymphangitis, or interstitial pancreatitis; omitting properly to explore the hepatic and the common duct; omitting definitely to determine the patulousness of the cystic duct when draining the gall-bladder; failure to recognize a stricture or a growth of the cystic, the hepatic, or the common ducts; failure to detect a stricture and to dilate to the normal the orifice of the papilla.

The most common error in operating for gall-stone disease is failure to remove all of the stones. Deaver says he has many times operated and removed a stone or stones that had evidently been overlooked at a previous operation. This, however, was not always the fault of the surgeon who performed the original operation. He has many times met with a gall-bladder full of stones, with the common, hepatic and two primary hepatic ducts also filled with stones.

Internal biliary fistula in the shape of cholecystogastrostomy, cholecystoduodenostomy, and cholecystocolostomy can be corrected only by severing the respective viscera and repairing the opening. In the majority of instances of this kind it may probably be best to excise the gall-bladder on account of disease of the same and to close the opening in the stomach, duodenum, or the colon, as the case may be.

In the treatment of external fistula, if the fistula is simply a gall-bladder one due, as is usually the case, to a stone obstructing the cystic duct, excision of the gall-bladder is the best practice, and if due to stricture excision is the only proper operation.

Contraction of the papilla of Vater, with consequent obstruction of the common duct, calls for dilatation of the papilla, carried out gradually through an incision into the duct.

Acute and chronic cholangitis are amenable to treatment only by bile drainage, best carried out by introducing a rubber T-tube into the common duct. Acute cholangitis is seldom seen except as a complication of infection of the gall-bladder or the common duct, and more often due to the presence of stone obstruction. Acute cholangitis due solely to inflammatory obstruction is comparatively rare; it does not differ from lithogenous obstructive cholangitis, and likewise calls for the establishment of free drainage.

Drainage can be made through the gall-bladder, if the cystic duct be patulous, and the condition of the gall-bladder warrants drainage. Drainage through the common duct is much more efficient and more reliable, and better suited, therefore, to bring about prompt results than is drainage of the gall-bladder.

Myocarditis, kidney degeneration, degen-

eration of the blood-vessels, diabetes, hematogenous infection, to say nothing of many other conditions, are the consequence of neglect—toxemia the result of gall-stone disease. The two most common sources of infection are the appendix and gall-bladder, the pathology of the appendix and gall-bladder having much in common.

Why are these operations so often done too late? The answer is, the patient's confidence in medicine; in the cures supposed to be brought about at the various springs, such as Carlsbad and others; the fear of operation and the advice of the physician who believes that many of the affections we are discussing are amenable to medical means. The arguments for and against medical versus surgical treatment must be based on pathological and anatomical facts as learned from making observations on the living and on the dead.

Neither vaccination nor serum treatment is applicable to biliary infection; in fact, there are no reliable medical measures that will remedy it. The much heralded "spring treatment," mud baths, and various other forms of baths prescribed, with the idea of causing metabolic changes for the betterment of the condition, can only be designated as temporizing measures.

THE PROBLEM OF TUBERCULOUS INFECTION IN CHILDREN.

DANA, in the *Boston Medical and Surgical Journal* of May 25, 1916, states that:

1. A large proportion of all children are infected with tuberculosis during childhood, and from this early infection most of the active tuberculosis of later life is believed to spring.

2. The general practitioner has not been interested in the diagnosis of these cases, and he has not awakened to the practical importance of such cases in the fight against tuberculosis. In fact he tends to deny the existence of such cases.

3. It is a safe general rule to follow that any child who shows constantly poor nutrition, fever, lack of vitality and ambition, abnormal pallor, or who is in other ways "below par," should have the benefit of fresh air and abundant suitable food, as well as frequent careful physical examinations by an expert.

4. Such cases should be sought for by the school physician, and when found should be followed along by the school or district nurse, who can take these patients to the local tuberculosis dispensary at stated intervals for examination. This need not necessarily interfere with the care of these patients by the family physician.

5. The *x*-ray does not distinguish, in general, between active cases needing active treatment and the latent or healed cases.

MIXED VACCINES CONTAINING BACILLUS TYPHOSUS, BACILLUS PARATYPHOSUS A, AND BACILLUS PARATYPHOSUS B, WITH REGARD TO THE REACTION PRODUCED AND THE ANTIBODY FORMATION.

In the *Journal of the Royal Army Medical Corps* for May, 1916, COPPINGER and GIBSON make a report on this subject and state that in summing up it is best to consider the reports on the reactions and the antibody produced together.

It is obvious that the dose of all three organisms should be kept as high as possible without the reactions becoming excessive. Small doses of a vaccine do not produce as good antibodies as large doses, and therefore one may reasonably expect that the immunity conferred is less in the case of the small doses without there being any direct relation between the two. In this series of experiments the most severe reactions taken all around were experienced among the men who received a single dose of one cubic centimeter of a vaccine containing a broth culture of bacillus typhosus, diluted to a strength of 1000 million, and bacillus paratyphosus A and B, of each in the case of Group A 500 million, and in the case of Group C 750 million.

In conjunction with this marked reaction they see a slow rise in the antibody production against bacillus typhosus. In the case of men in Group B, in which an agar vaccine of bacillus typhosus was used, a much

quicker rise in the antibody elaboration goes hand in hand with a less marked though longer delayed reaction.

This discrepancy between the agar and broth bacillus typhosus vaccine is lost sight of by the end of the third week, after which the titres of the two sera were found to stand at the same level.

They were unfortunate in losing sight of the men inoculated with the agar vaccine so soon, as they have always thought that protection afforded by a broth vaccine lasts longer than that produced by the same organism grown on agar. They think that this may be explained by the fact that an organism grown in broth is more liable to autolysis than if grown on agar. On account of this autolysis, the dose of a broth vaccine is really higher than that estimated, while at the same time it necessarily becomes more toxic.

In the case of B. paratyphosus A there is very little to choose between a single dose of one cubic centimeter containing 500 million and a single dose of the vaccine containing 750 million, as at the end of six weeks the titre of the first is 1 in 20 and that of the second 1 in 40. The effect of the larger dose is slightly more marked in the case of B. paratyphosus B.

Turning to the results with the double doses of 0.5 and one cubic centimeter of the vaccines containing the two strengths of the paratyphoid bacilli, the reactions were not more marked than in the case of the old antityphoid vaccine, and very much less marked than in the case of the single doses of the mixed vaccines.

On the other hand, much more agglutinin was produced, and in this case the administration of the larger doses of B. paratyphosus A and B produced a higher titre for A and B at the end of six weeks than did the smaller dose. In the case of B. typhosus, of course, the same dose was given in each case, and the titre of sera was identical.

Another curious fact which has come to light in the course of these experiments is that whereas in rabbits they found that B. paratyphosus A in the vaccine produced more agglutinin in the sera than did B. typhosus or B. paratyphosus B, yet they could not demonstrate thermostable opsonins for this organism any more than they could in the case of man (the same strain being used in each case). From these experiments the following conclusions may be drawn:

1. The highest dosage used is the best for producing lasting antibodies against these three organisms, and the vaccine should be given in two doses rather than in one, both on account of the reaction produced by the single dose of one cubic centimeter, and also on account of the higher antibody content produced when the two doses are given.

2. The want of antibody production for B. paratyphosus A is a very strong feature of these experiments when compared with those elaborated for B. typhosus and B. paratyphosus B. As to the immunity produced against this organism, that can only be decided by actual trial, but the results obtained in the course of these experiments seem to point to the fact that the B. paratyphosus A content of the vaccine may not achieve its object to the same extent as that of B. typhosus and B. paratyphosus B.

THE PROBLEM OF RINGWORM IN CHILDREN.

In the *Boston Medical and Surgical Journal* of May 25, 1916, OLIVER reaches these conclusions:

1. Ringworm of the scalp is a highly contagious disease.

2. The older methods of treating ringworm of the scalp are inefficient.

3. The treatment of this disease with *x*-rays, placed upon a practical basis by Sabouraud and Noiré, has proved to be highly efficient. In Paris it has shortened the course of the disease from two years to three months.

4. The objection to the use of *x*-rays in ringworm, on account of the possibility of producing permanent baldness, owing to inability to measure the rays properly, seems to be answered by the introduction of the Coolidge tube, with which the

amount of rays absorbed can be measured with great accuracy.

5. Radiologists as well as dermatologists, in the United States, have been slow to grasp the importance of the *x*-ray treatment of this disease, but it is to be hoped that, before long, all cases will be treated by this method, which, while it probably will never eradicate the disease, should make it much less frequent in the future than in the past.

THE ABUSE OF TINCTURE OF IODINE.

The *New York Medical Journal* of May 20, 1916, says it is obvious that the dressing of a recent infected and suppurating wound ought not to be the same as that of one in process of rapid cicatrization; in the former case an energetic antiseptic action is required, which, in the latter, could do only harm. Nigay (*Journal de Médecine de Paris,* April, 1916) has noticed a custom among dressers of using a routine procedure of (1) cleansing; (2) two or three applications of a ten-per-cent iodine solution; (3) application of a dry compress. Such a routine may injure the finer cellular layer which is at the basis of cicatrization, and iodine in such strength may even destroy the healthy epidermis, or cause a patch of eczema, especially if it is not freshly prepared and hydriodic acid has formed. Nigay remarks that this acid may be destroyed by adding one per cent of iodic acid (HIO_3), which in the presence of hydriodic acid forms iodine and water. The addition of four per cent of potassium iodide will also destroy the irritating acid. The 95-per-cent alcohol of the tincture is, according to Nigay, too irritating to be applied to a healing wound; its great affinity for water dehydrates the cells and coagulates albumin. Reclus never used an iodine preparation stronger than one in fifteen of alcohol—about the strength of U.S.P. tincture—and always insisted on a fresh preparation. Nigay thinks that even this formula of Reclus may cause damage if used too freely, and he has seen many wounds which were doing badly under its application heal beautifully after it was stopped.

The final application of a dry dressing, according to the writer, is a mistake, as it is almost invariably too tight, and when removed with the speed required in military hospitals, generally takes with it an important layer of reconstructed tissues. Nigay's own method of treating wounds comprises irrigation without pressure, gentle wiping with a dry compress, and the application of an ointment—for example, that of Reclus:

Corrosive sublimate, 0.03 gramme;
Phenol in crystals, 0.30 gramme;
Salol, 1 gramme;
Iodoform, 0.50 gramme;
Antipyrin, 5 grammes;
Boric acid, 5 grammes;
Sterile petrolatum, 40 grammes.

Where this ointment is not easily obtained, Nigay uses a four-per-cent salol ointment or even sterilized petrolatum alone. Such treatment, he says, has proved more efficacious in his hands than that of the indiscriminate application of iodine, a precious agent indeed, but not to be used without care and discretion.

VACCINE TREATMENT OF CHRONIC SUPPURATIVE OTITIS MEDIA.

In the *Pennsylvania Medical Journal* for May, 1916, COATES and ERSNER point out that miracles must not be expected from vaccines, as they are expected from the use of antitoxin in diphtheria, for in many of their patients four or five vaccines were prepared before the ears became dry. It must be remembered that vaccine therapy is simply stimulating antibody formation, or, as Vaughn would have it, of "proteid-splitting substances." Each area of inoculation becomes a little laboratory and storing center, from which these antibodies gradually find their way into the circulation to combat the ailment.

Since all the complement fixations were negative, they conclude either that (*a*) it is possible that only a few free amboceptors are circulating in the blood in these cases; (*b*) the bacteria in a discharging ear are too attenuated to stimulate antibody production; (*c*) a lowered vitality of the body may

antagonize the response to the infection; (*d*) the pathological tissue in the middle ear, as indicated above, does not respond to the vaccines as healthy tissue will, and what holds true in the case of vaccine should also be true for direct infection; (*e*) the area may be so well walled off that absorption cannot take place; (*f*) the technique for complement fixation employed was probably not delicate enough, and possibly in time a more sensitive test will be evolved, yielding better results.

These theories are only speculative, however. The question is how to overcome chronic suppurative otitis media, and in order to accomplish this we must in some way stimulate the body. Having no direct means to stimulate the body, other than by expectant treatment, vaccine is recommended as such a body stimulant, exclusive of the fact that dry ears may thus result.

It is advisable for esthetic and hygienic reasons to continue with local treatment.

Subcutaneous inoculation is most satisfactory, for antibody formation can only be expected in healthy tissues, and failures resulting from administering vaccine directly into the middle ear would seem to prove that pathologic tissue cannot produce antibodies.

The utmost effort should be made to discover a method whereby we can tell whether the causative bacteria have been obtained, as otherwise vaccine therapy will remain empirical in chronic suppurative otitis media. They failed in their complement fixation tests with the three antigens composed of polyvalent strains of staphylococcus, pyocyaneus, and pseudodiphtheria, but they hope to obtain more strains to work with, and to report at some future date.

From the fact that the twenty-one Wassermann tests for syphilis were all negative, it seems evident that this disease did not play any appreciable part in the results obtained in this series, and, particularly, that it did not account for the failures. Of the twenty-five von Pirquet tests for tuberculosis four were significant and three others were suggestive. As these cases were all in adults, whose middle ears showed none of the accepted signs of tubercular invasion, and from whom no tubercle bacilli were recovered, it is possible that there was some old, healed focus elsewhere in the body. In spite of the negative histories, and the general healthy appearance of these seven individuals, the positive reactions may indicate a lowered vitality of resistance that would, in part at least, account for the failure to raise the body immunity against the specific organisms.

To those patients who were discouraged with the vaccine treatment, and to those waiting for new vaccines to be prepared, a solution containing one-half a grain of emetine hydrochloride was instilled into the ear, with the idea that the ameba buccalis might be prolonging the suppuration. There were no improvements, with the exception of one patient who was a diabetic, and who also had pyorrhea alveolaris and bilateral suppurative otitis media. After searching for several weeks the ameba was found in the warm specimen of pus from the middle ear, and in their enthusiasm they immediately administered emetine hydrochloride, in addition to autogenous staphylococcus vaccine. The eczema of the external canal subsided, the right ear became dry, but they were unable again to recover ameba from the discharge in the ear.

THE TREATMENT OF SYPHILIS DURING THE FIRST SIX MONTHS AFTER INFECTION.

In the *Cleveland Medical Journal* for April, 1916, CORLETT points out that the early eruptive, or for convenience of description the second, stage of syphilis is the one most frequently encountered by the medical attendant. Here every structure of the body is thoroughly involved, particularly the tunica intima of the blood-vessels, and scarcely to a less extent the internal viscera and the cerebrospinal structures. Here, again, time is of the greatest importance, for the inflammatory changes set up by the presence of spirochæta lead to destruction and, in the main, constitute the sequelæ of syphilis. Salvarsan, or its equivalent, is in-

dicated in consequence of its rapid parasitotropic action and consequently is the best preparation to be used.

The dose depends on the body weight, and in general may be estimated at from 0.3 to 0.6 gm. It is best given intravenously, and repeated at weekly or ten-day intervals, until from four to ten have been given. The frequency of administration as well as the size of the dose to be given depends on the reaction, if any, which follows each dose. Usually it is slightly if at all noticeable. As to the number to be given, the Wassermann tests, when made with sufficient skill and care be exercised, furnish the best means of determining this point. Should it become negative, it is well to discontinue salvarsan, and after an interval of two weeks, care being taken that the tubules of the kidney show no evidence of irritation, recourse may be had to intramuscular injections of mercury.

If, on the contrary, the patient be first seen toward the end of the first six months after infection, and no intensive treatment has been followed, then the indication for salvarsan is not so clear. In the absence of any complication or involvement of important structures, such as the eye, salvarsan or mercury may be instituted and the need of pushing either to its full tolerance is less urgent. Whichever drug is selected—and again in this instance Corlett prefers the former—the best results are obtained by a change before the spirochætæ become accustomed and to a certain degree immune to the spirillicide. This may not occur for several months, but it is well to bear in mind. Mercury is slower in its action and may be continued over a longer period, although it is advisable to supplement its use by suitable periods of rest. The most potent form of mercury is the gray oil (oleum cinereum), in 1.5 gm. of which about two grains of metallic mercury is injected weekly intramuscularly for six weeks, followed by an interval of six weeks before the second course is given. Since many fatal results have been reported it should not be given except under the most careful attention to details. First it must be ascertained that no involvement of the tubules of the kidneys exists, and that the other eliminative organs are functioning properly. When there is evidence that the drug is not being absorbed, as when the therapeutic effect is arrested or none is obtained, its use should not be persisted in, but recourse should be had to one of the soluble salts of mercury. Again, on the first symptoms of ptyalism it should be stopped.

The technique is also of importance. Care must be taken to separate the cylinder of the syringe from the needle after its insertion, to see that a blood-vessel has not been entered, and a fatal dose be thrown directly into the circulation. With these precautions carefully observed by one sufficiently skilled, a minimum amount of danger attends its use.

Calomel suspended in paraffin is likewise one of the strongest preparations of mercury thus employed. The dose is .065 gm. or one grain given intramuscularly once a week for ten weeks, followed by a rest period of from four to six weeks. The objection to calomel is that it is more often painful than milder preparations, and fatal results have also been reported. The salicylate of mercury, from 10 to 20 per cent in paraffin, of which from 0.6 to 0.9 Cc. (ten to fifteen minims) are injected once a week for fifteen weeks, is the mildest form of the insoluble preparations of mercury. It is also efficient, as the results obtained during a period of more than twenty years have demonstrated.

For ambulatory cases these insoluble forms of mercury are to be preferred because they are efficient, devoid of danger if properly given, and the patient is relieved of making biweekly or more frequent calls on his physician. On the other hand, the soluble salts of mercury are quickly absorbed when given hypodermically or intramuscularly, are less painful, and are less liable to be followed by painful nodules, which sometimes occur when the insoluble salts are used. In other words, less care and skill are required in their administration. When a quick action is required, and salvarsan is not selected, this is the method

of choice, particularly in hospital practice. The preparations most commonly given are either the bichloride or the biniodide. The former is more generally given, as in the following formula:

℞ Hydrargyri, 0.50;
Sodii chloridi, 0.25;
Aquæ destillatæ, 30.00.

Of this from 0.9 to 1.2 Cc. (fifteen to twenty minims) is injected two to three times a week.

From an extensive use Corlett can recommend this:

℞ Hydrargyri, 0.06;
Sodii iodidi, 0.06;
Aquæ destillatæ, 15.00.

Of which 0.6 Cc. (ten minims) is injected as in the above. It is claimed that with the former an albuminate forms, thus impeding its absorption; clinically Corlett has observed no evidence of this, and it seems of equal value to the latter in the therapeutic results.

With mercury, therefore, the cycle is complete, and as in the time of which Antonius Chaumette wrote, the intensive use of the drug is again employed, but fortunately with less dire results to the patient.

In the treatment during the first six months, the ingestion of antiluetic drugs by the mouth has no place. Nor can we expect, excepting possibly in the abortive stage, to cure syphilis in this period of time, although more may be accomplished toward its elimination than during any twelve months later in its course, and Corlett believes all of the complications and sequelæ may during this time be reduced to a fractional percentage.

THE TREATMENT OF ANTERIOR POLIOMYELITIS.

The *New York State Journal of Medicine* for August, 1916, contains an article by WALLACE on this important topic. He discusses the treatment in detail:

1. Stage of onset: May last several days, may be brief or entirely absent.

The vast majority of the cases observed by the author during the epidemic in New York City in 1907 began suddenly with fever, some nausea or vomiting, constipation, malaise, headache, sometimes convulsions, and pain around the joints and in the muscles; but a few had no general symptoms or they were overlooked, they having been well and healthy before retiring, and a limp or loss of power upon arising was the first intimation that they had suffered an attack.

Prevention is the most important thing to be considered. Various carriers have been suggested, but in all probability the human being is the one that offends most frequently. The patient should be isolated for at least six weeks, in a room from which all curtains, rugs, and whatever other furnishings that might catch the dust, have been removed. Those coming in direct contact with the patient should carry out about the same routine as in diphtheria and typhoid fever. The mouth and nose should be kept clean by some mild antiseptic solution. Handkerchiefs, cloths, and excreta should be destroyed, and the floors wiped daily with a wet cloth.

The treatment of the patient's symptoms at this time is very important. A thorough evacuation of the bowels by administering castor oil, calomel, or Epsom salts, and an enema, is not only beneficial to the intestinal tract, but also relieves much of the congestion in the spinal canal. Urotropine in doses of from two to three grains, every four hours, has been prescribed with questionable benefit, for its effect upon the contents of the cerebrospinal canal. Salol from two to five grains also may be used as a gastrointestinal disinfectant. Heat over the spine and tender muscles and joints is most efficacious in relieving the pain. For the respiration and heart, atropine and strychnine may be given, and the latter, perhaps, might be continued during the first year for its tonic effect upon the muscles. Absolute rest is an essential feature of the entire treatment during this stage. The patient should be placed upon a bed which permits of no sagging, preferably a fracture bed, and in a room that is kept thoroughly ventilated. Plaster of Paris bandages should be applied

to the feet in order to prevent contractions of the tendo Achillis, and the weight of these bandages will also help in combating the efforts of contraction of the flexors at the hips and knees.

2. Stage of apparent paralysis:

When the condition of the patient simulates that of complete paralysis of many groups of muscles and several of the supposedly paralyzed muscles regain their power, it may be called the apparently paralytic stage. Prolonged bed treatment for two or three months, if the onset was severe, prevents back deformities. Daily sponging with alcohol, and skin rubbing to avoid decubitus, should not be forgotten. Hot fomentations and baths may be given for the pain during the first week or ten days. In the bulbospinal type, all movements should be restricted, especially sitting up. The adult will coöperate in this treatment, but the child may have to have his trunk and lower extremities incorporated in plaster of Paris, from his axilla to his toes, or some form of back brace with limb parts attached, in order to control him.

3. Stage of recovery or convalescence:

During this period, which for our purposes is from the third month to the second year, daily muscle massage should be given and manipulations and stretchings of the active muscles are indicated. Braces are used to protect against severe strain of the paralyzed muscles, stretchings of the ligaments about the joints, and to avoid contractures of the healthy ones. Overbracing is preferable during the earlier months, after which it is gradually diminished as the strength of the part returns. Electrotherapeutics may be of some value and should be used during the first year. The faradic or interrupted galvanic currents are suggested. Small doses of strychnine are used as a muscle stimulant.

4. Readjustment of permanent paralysis:

The vast majority have some muscles of the legs permanently paralyzed, and one can determine the exact muscles by the loss of voluntary contraction, the disappearance of the belly of the muscle due to atrophy, or by aid of the electrical current, applied to the individual muscles which will give reaction of degeneration. Continued improvement may be expected in the afflicted member perhaps several years after the onset, provided it is correctly braced and supervised. Functional use should be encouraged under the protection of apparatus.

The joints of the supporting machine should be carefully selected; the aim should be to permit motion in the direction of the muscles about the articulations, which have been put out of commission. Theoretically this allows shortening of the ligaments and tendons that receive their nerve supply from the degenerated nerve cells. In other words, every endeavor should be made to maintain the muscle balance of the member in a physiological attitude.

Muscle education is contraindicated. The attempts to train and to develop paralyzed muscles are not only useless and wasteful, but are detrimental. To give patients sitting-up exercises, especially the trunk or back ones, when loss of power occurs on one side of the vertebral column, causes severe rotary lateral curvature. This has been frequently practiced by others and has aggravated the deformity by overdeveloping the well muscles. The sane treatment of these backs is the application of plaster of Paris jackets or proper back braces, in order to prevent the deviation. When this has occurred one's efforts at correction cause the patient considerable discomfort and they are not always successful. As previously mentioned prolonged recumbency in a horizontal plane during the earlier months is a most potent prophylactic agency for such a condition.

If the foregoing mechanical and therapeutic steps are followed, many unsightly malformations will not occur, and at least one-fifth of the operations upon this class of patients will be unnecessary, because about this proportion of them are done for contractures.

The operative treatment for the disabilities and deformities following anterior poliomyelitis offers a most prolific field, but no case should be operated upon without a careful study of it, and one should be con-

vinced that material benefit will be rendered to the patient. We must look forward to the time when the patient arrives at the age of deciding matters for himself, and will upon his own responsibility discard all apparatus no matter what his condition may be. It is one's duty to have him in the best possible shape for locomotion.

Multiple contractures existing in an individual should be treated by stretching of some of the muscles and tenotomizing subcutaneously some of the strongest ones. It is often advisable to do this at separate times, because of the risk to the patient when done too strenuously. It often happens that the power of dorsal flexion of the foot is regained, although the extensors seem paralyzed because of the severe equinus, when the tendo Achillis is lengthened. The preference is again given to the subcutaneous method, and care should be taken not to bring the foot up to more than two or three degrees less than a right angle to the leg.

Tendon transplantations for paralysis of muscles going to the foot have not been valuable, as they do not stand the test of time. It is almost impossible to balance the body weight upon the astragalus when either the anterior, posterior, or lateral group of muscles are paralyzed. One therefore advocates the removal of this bone in order to get a firm weight-bearing foundation. Tendon transference thus supplemented produces a much improved foot when varus or valgus deformity is present. The operation of removing the astragalus, displacing the foot backward, and utilizing the peroneals as a stay by suturing them to the tendo Achillis, advocated by Dr. Royal Whitman, gives the best obtainable foot when its deformity is one of calcaneus, calcaneo-valgus, or dangle-foot. When successful this gives a firm base for standing and walking. The circulation to the foot is improved, and the ability to use it without a brace stimulates the growth of the entire limb.

When the quadriceps extensor tendon is paralyzed and both hamstrings are strong and active, the implantation of the stronger of these often restores active extension of the leg and prevents recurvatum. The success of this operation permits the patient to set aside his braces.

The lasting effect of any operative procedure depends upon assiduous and vigilant after-care. The correct attitude should be maintained for months and the patient seen at frequent intervals. Warning should be given that too much strain or liberty to the operated member may prevent obtaining an ideal result.

ADRENALIN IN POLIOMYELITIS.

HAAS in the *Medical Record* of Septemtember 2, 1916, writes that during the course of an epidemic of a disease the therapeusis of which is still unsettled, it would appear wise to report cases upon which the newer procedures were tried, that the results of such procedures may stimulate or discourage further application.

The following three consecutive cases of infantile paralysis were seen in consultation. The treatment consisted of adrenalin administered intraspinally, after the withdrawal of cerebrospinal fluid, and in one case the use of immune serum in addition.

Case 1.—Boy, six years (bulbar type); ill three days; temperature 105°; glands enlarged at angle of jaws; supposed to be suffering from nasopharyngitis. The symptoms were vomiting, inability to swallow, irregular respiration, involuntary evacuation of urine and feces. The child was in coma, there was retraction of head, the occiput rested upon spine, the sclera only showing; respiration of the Biot type; Macewen, Brudzinski, and Kernig signs present. Knee-jerks absent, temperature 105°, pulse 120, respiration varying from 1 to 30 per minute, condition growing constantly worse. Spinal puncture performed and 70 Cc. clear fluid withdrawn; 6 Cc. 1:1000 adrenalin administered by gravity; convulsive twitching followed procedure for several hours. Six hours later condition was no worse than when puncture was done; a second puncture was made, and was a dry tap, although repeated attempts were

made to withdraw fluid; no adrenalin was administered at this time. The condition continued to improve. After twelve hours there was a short period of consciousness; the child was able to swallow teaspoonful doses of water; respiration was less irregular.

Eighteen hours after the withdrawal of fluid and administration of adrenalin the child was conscious, rigidity was almost absent, he swallowed well, respiration was regular, temperature 99°, and except for weakness of all muscles the boy was apparently not very ill. Three weeks after onset he was entirely normal except for slight weakness in the lower extremities, which is growing less daily, and which does not interfere with walking.

Case 2.—Boy, 4½ years (bulbar type); symptoms similar to those in Case 1, except that respiration was not so seriously affected. An intraspinal adrenalin injection was given forty-eight hours after onset of acute symptoms, and repeated four times. Immune serum was once administered intraspinally. Recovery from severe symptoms required four days. Two weeks later the boy was entirely normal except for slight weakness of the external recti muscles of both eyes.

Case 3.—Boy, 2½ years (spinal type); paresthesia marked; ill five days, with irregular temperature and symptoms. There was slight rigidity of the neck; Brudzinski and Kernig signs present; knee-jerks absent. Paralysis of all extremities and muscles of chest; involuntary evacuation of urine and feces. Temperature 103°, pulse 130, respiration regular but difficult. Spinal puncture was performed twenty-four hours after acute symptoms appeared—60 Cc. clear fluid withdrawn, and adrenalin administered as above; this was repeated once. Temperature normal after seventy-two hours. Fourteen days after the first puncture there was complete restoration of the upper and left lower extremities, with partial restoration of the muscular activity of the right lower extremity.

The foregoing cases are briefly reported, not as showing results of treatment, but to place on record the experience with a procedure which is apparently harmless and full of promise. The only untoward result of this therapeutic measure was a rather severe urticaria appearing within twenty-four hours in Cases 1 and 2.

In contrast with the results in the foregoing cases are five cases of this disease seen prior to them in which no intraspinal injections were given. Two died of respiratory paralysis. One has a spastic paraplegia of both lower extremities after six weeks. One has a flaccid paralysis of both lower extremities after eight weeks. One has made a complete recovery. It would appear that the ideal treatment in the light of present knowledge and experience consists of: (1) Early puncture and withdrawal of cerebrospinal fluid; (2) administration of adrenalin intraspinally; (3) followed immediately with the introduction of immune serum or, in its absence, normal serum.

THE PRESENT STATUS OF MAGNESIUM SULPHATE IN THE TREATMENT OF TETANUS.

The *Archives of Internal Medicine* of May 15, 1916, contains an article by ROBERTSON in which he reviews this question in its entirety and makes special reference to the latest "magnesium" article by Meltzer, printed in both the *Berliner klinische Wochenschrift* and the *Lancet*. He first emphasizes the possibility that the cause of death in tetanus may be a direct result of the severe and exhausting spasms, and that, by controlling these with magnesium sulphate, the life of the patient is lengthened and thereby his chances of recovery are increased, because of the formation within the body of antitoxin and the ability of the affected nerve cells to return to a normal state. He believes that magnesium narcosis is due to the passing of the magnesium sulphate out of the lymph stream into the free space which contains the points of contact of the branches of two or more neuron systems, where the salt interrupts the conductivity of afferent and efferent impulses through the neurons. Thence arises the

narcosis, the analgesia, and the relaxation of muscles.

In discussing the various modes of administration, attention is directed to the following points: The dosage by the intraspinal route should be 1 Cc. of a 25-per-cent solution for every 10 kg. (22 pounds) body weight; the effect of a 25-per-cent solution, which is nearly molecular, is sharper and more certain than that of less concentrated solutions, and there is no clear evidence in the literature showing any toxic action of such injections on the heart; in cases of respiratory disturbances (which in his experience are very frequent) one needs only to wash out the spinal canal with physiological saline, remembering that calcium chloride, physostigmine, or eserine does not afford relief in this particular method; and, finally, in children Kocher's failure with the intraspinal method and Falk's success with the subcutaneous are perhaps due to the more rapid diffusion in the subdural and arachnoidal spaces of brain and cord in children, compared with adults, as well as the more rapid absorption of the salt from the subcutaneous tissues of the former.

The subcutaneous method gives a slower and hence a possible cumulative action, so that small doses frequently repeated are sufficient in many cases to produce a continuous effect. He emphasizes the sharp distinction to be made between subcutaneous and intramuscular injections, the latter acting in a much more rapid and hence more toxic manner. Therefore, caution is to be used not to penetrate accidentally too deeply with the injecting needle. The fact is reiterated that magnesium salts energize the anesthetic properties of ether so that a combination of the two in small doses leads to a deep narcosis and relaxation which is of considerable duration. Chloroform and other narcotics do not possess this property to nearly so marked a degree. He states that nephritis contraindicates the method for (at least) surgical anesthesia. Meltzer notes that a signal advantage of the subcutaneous method is the ease of controlling any dangerous effects of the drug; the administration of 1 mg. of physostigmine or eserine (0.0015 gm.), the injection of an isotonic solution (about 2 per cent) of calcium chloride into the muscles in doses of about 50 Cc., or into the veins of a 2-per-cent solution in physiological saline up to 500 Cc., being sufficient to remove at once the depressive action of the magnesium salt.

Lastly, in the routine treatment of tetanus Meltzer recommends starting with a subcutaneous injection of 0.3 gm. or 1.2 Cc. of a 25-per-cent solution per kilo (about 10 Cc. for a normal male adult), repeated four times a day. If severe spasms occur, ether should be used and the dose of magnesium increased to 0.5 gm. per kilo (16 Cc. of 25-per-cent solution for adult male). The bladder may need to be emptied by catheterization. In case of danger from respiratory failure one can resort to the remedies mentioned above as well as the application of an Esmarch bandage to hinder absorption of the salt. In desperate cases artificial respiration should be used. If the symptoms are too severe or the subcutaneous injections fail, the intraspinal method is advised. Antitetanus serum should always be used.

To this admirable summary of this subject by Meltzer there is little to add in conclusion. There can be no doubt in the minds of those who review the evidence that in magnesium sulphate we possess a most valuable addition to our armamentarium in the treatment of tetanus. No such imposing array of facts can be brought forward in favor of chloral or allied narcotic agents, even granting their occasionally apparent good effects.

One further point needs emphasis. It is clearly evident that the drug must be used boldly, if its maximum therapeutic effect is to be obtained; that this bold use is subject to certain dangers, undoubtedly greater in some patients than in others; that these dangers, when threatening, may be rapidly relieved by simple and easily applied measures; and that, therefore, while this salt is being used, the patient must be under continuous expert attendance, with preparations already made to administer, rapidly, restor-

ative remedies. In Robertson's studies of the treatment of tetanus both in man and in animals he has been struck by the need of constantly watching the patient's condition. The disease at its best is a most desperate one, and the remedies must be used as soon as possible and their therapeutic limits attained at the earliest possible moment. It is only in this way that good results may be expected in severe cases. We watch a patient under anesthesia, a woman in childbirth, a case threatened with internal hemorrhage. How much more important in tetanus, with almost sure death before us, that we employ our resources to the limit and immediately meet every change with the necessary maximum therapeutic measures.

The treatment of tetanus has not yet reached the ideal stage. Prophylaxis of all dirty wounds is still our surest weapon of defense. However, it is difficult to avoid the conclusion that in outbroken cases, in addition to antitoxic serum, one's duty is sadly neglected if early, vigorous, and continuous efforts are not made to control the spasms, relieve the distress and pain, and give rest and nourishment by subcutaneous injections of magnesium sulphate in amounts large enough to bring about the desired results.

CHRONIC INTESTINAL STASIS FROM THE VIEW-POINT OF THE INTERNIST.

AARON, writing in the *Buffalo Medical Journal* for August, 1916, tells us there is no treatment that has given him better results in chronic intestinal stasis than Fleiner's oil cure. This consists in injecting into the rectum once daily 250 to 500 mils (½ to 1 pint) of olive oil. He has used pure cottonseed oil with equal benefit. The oil is to be retained in the bowel for a considerable time; it is best to retain it over night if possible. These injections are continued several months, at first daily, later every other day, and subsequently twice a week.

In cases of spastic constipation the oil has a soothing effect on the mucous membrane, thus relieving spasm; and in atonic constipation it strengthens the muscular tonus. Besides, it lubricates the gut, softens fecal agglomerations, and forms a protective layer upon the damaged mucous membrane.

When there is putrefacation, lactic acid may be prescribed, best in the potential form of the Bulgarian bacillus. The cultures are available in liquid and tablet form. The efficacy of this treatment is enhanced by a diet preponderantly carbohydrate and by restriction of proteins. The intestinal flora should show a change after a few days.

TREATMENT OF CARRIERS OF AMEBIC DYSENTERY.

DALE in the *Lancet* of July 29, 1916, says that the treatment of entamebiasis in England during the past year has been largely concerned with the problem of freeing the chronic "carriers" from their infection. Experience in Egypt in dealing with patients who continue to pass cysts after the dysentery has completely cleared up seems to have led to the conclusion that a full course of 10 or 12 grains of emetine hydrochloride, given hypodermically, will practically always eradicate the infection. The experience in England, to judge from hospital records which Dale has had the privilege of seeing, does not altogether tally with this; for there seems to have been a not inconsiderable proportion of cases in which such a course of emetine has led only to a temporary absence of cysts from the feces, followed by an early recurrence. These cases, relapsing into cyst-passing again and again after successive courses of emetine, have presented a difficult problem to the medical officers in charge of them. Their frequent occurrence among the cases treated in England was to be expected, for these consisted largely of cases which had undergone relapse into chronic "carrying," after apparently successful treatment of their acute infection with emetine; others had probably never been freed, by repeated dosage with emetine, before their return to England; while others, again, were appar-

ently "contact carriers," with no history of previous dysentery or treatment. It was clearly a matter of importance that these men should be freed from the danger to themselves and to others entailed by the persistent focus of infection.

The pathology of the chronic carrier of entameba histolytica seems to be still imperfect in that it has not been definitely ascertained whether the cyst-producing entamebæ are living freely in the intestinal contents, like entameba coli, or are localized in a partly healed pocket or sinus. The occurrence of liver abscess without acute dysentery seems to favor the latter supposition. In either case the relative failure of hypodermic treatment with emetine in this condition could be explained by the entameba being more or less completely shut off from the circulation and tissue fluids of the patient. The alleged superior efficiency in these cases of the older treatment with ipecacuanha by the mouth is in line with such a conception. By these considerations Dale was led to suggest a trial, in cases refractory to hypodermic emetine, of oral administration of this alkaloid in the form which gave promise of combining the advantages of the ipecacuanha treatment with freedom from its notorious difficulties and drawbacks. The results have been so far promising that it seems worth while, in the interests of a wider trial, to make mention of them at their present stage of incompleteness.

The compound which has been used is a double iodide of emetine and bismuth which was described last year by Du Mez, who suggested it as suitable for oral administration of emetine. It has the useful property, from this point of view, of being practically insoluble in dilute acids, but soluble with comparative ease in weak alkali. It might be expected therefore to pass the stomach unaltered, and then, being dissolved in the alkaline juices of the duodenum, to undergo gradual decomposition as it passed along the bowel, with liberation of emetine and precipitation of bismuth sulphide. Du Mez obtained promising, but rather irregular, results on dogs to which he gave the compound. So far as Dale has been able to ascertain it has not hitherto been tried clinically.

Dale's colleague, Dr. Barger, prepared a sample of this double iodide, and Dale tested it, in the first place, on cats. He found that large cats, weighing upward of 3 kilogrammes, could take repeated doses of 40 milligrammes without vomiting, the only effect being some looseness of the bowel. Sixty milligrammes (containing about 20 milligrammes of emetine) produced vomiting, but the fact that this occurred some five hours after the administration, while purgation occurred about one and a half hours after the drug had been given, indicated that the vomiting was not due to direct irritation of the stomach, but was secondary to liberation and absorption of emetine in the bowel, and therefore comparable to the vomiting which follows a large hypodermic dose. If treatment with these larger doses was continued, the symptoms of chronic emetine poisoning, which Dale has previously described, made their appearance, as with hypodermic administration.

A TREATMENT FOR PRURITUS ANI.

In the *Bulletin of the Johns Hopkins Hospital* for August, 1916, STONE tells us that the success of alcohol injections for producing localized lasting anesthesia, in facial and other forms of neuralgia, suggested the application of the same principle to the abolition of unpleasant sensations about the anal and perianal regions. The alcohol, of course, produces its effect by destruction of the nerve fibers with which it comes in contact. Hence, in essential principle, such a treatment is quite analogous to the Ball and Lynch operation, in which the cutaneous nerves are destroyed by direct mechanical division, instead of by chemical attack. The alcohol method presents certain definite advantages that will be referred to later; there are certain possible advantages, also, that will be considered at once. Since there is no selective action of alcohol, by which

motor nerves are spared, and only sensory ones are injured, one might expect a loss of sphincter control, if the injections were allowed to come in close contact with the motor branches to the muscles. Moreover, an injection of a substance causing tissue destruction, if too superficially placed, might be expected to cause a slough and resultant ulceration.

In order to test these possibilities by actual experiments, alcohol injections were made into the anal region in dogs, the depth of the introduction being varied. Without detailing the protocols of experiments, the following facts were clearly proved: Alcohol injections will produce complete local anesthesia. If introduced deeply enough to come in contact with the motor nerves, sphincter paralysis and resultant incontinence are produced. If introduced quite superficially—that is, within the skin itself—superficial sloughs are caused. It is quite possible, however, and not very difficult, to produce anesthesia without sphincter paralysis or skin ulceration; this effect is brought about by introducing the needle entirely through the skin, and injecting the alcohol immediately under the skin and never more deeply.

The method has been tried by Dr. Arthur Hebb and the writer in the dispensary of the Johns Hopkins Hospital and in their private practice on 17 cases so far, during a period covering less than two years. The facts observed are as follows: With the technique employed there is not much pain associated with the injection. There is some soreness during the first twenty-four hours, after which the only subjective sensation remarked is numbness. The itching is immediately abolished and the area injected is largely or completely anesthetic. No case so far has shown the slightest evidence of disturbance in the action of the sphincter. There were several cases in which small superficial sloughs resulted, but these all healed promptly and without difficulty. They were due to faulty technique in placing the alcohol too superficially, a fault due to the careful avoidance of too deep an injection and to the fact that the folded, irregular surface of the skin about the anus renders it much more difficult to keep the injections at a uniform depth than would be the case were the surface level. How long the freedom from itching will last is not known. One patient returned for a second injection eight months after the first, for a recurrence of itching. All of the patients seemed much gratified with the results obtained, so far as they were able to follow them.

An interesting change is to be noted in the physical appearance of the skin after a patient has received this treatment. The skin in typical cases of severe pruritus is thrown into thickened folds and ridges; it looks edematous and grayish-white, with red scratch-marks and superficial fissures radiating from the anus, and feels stiff and indurated. A few days after an alcohol injection the folds become less pronounced and rugged; the color becomes more that of normal "flesh-color," and the scratch-marks disappear. In short, there is a return to the normal appearance of the skin in this region.

The technique of injection is quite simple. The area in which the itching is complained of is carefully noted from the patient's description, and indeed is usually well marked out by the characteristic features just described. Under general or local anesthesia, the injection is then made so that this whole area is anesthetized. In nearly all the cases here reported, a local anesthetic, usually novocaine (1 per cent) or quinine and urea hydrochloride (1 per cent) has been employed. This form of anesthesia has proven quite satisfactory. The syringe is filled with alcohol (95 per cent) and the usual fine hypodermic needle used for the injection. The needle is carried entirely through the skin vertically, and then is inclined sharply through to the side so that it lies nearly parallel to the skin surface. When the needle is properly inserted in the subcutaneous fat, it can be moved fairly freely from side to side under the skin and can be felt moving with the finger placed over it. If this freedom of movement is lacking, the needle is probably engaged in the corium, and if injections are thus made, sloughs may

be expected to result. With the needle properly placed the whole area involved is injected, enough alcohol being used to underlay the area thoroughly. The injection may be carried up to the margin of the anus, but Stone has never injected the anal canal itself, nor has he so far had reason to believe that this would have improved the results. Of course, before any injection is made, the skin is cleaned up as for any other operative procedure.

This method accomplishes practically the same thing as the operative treatment for pruritus, and is indicated in those cases of great intensity in which the usual measures have failed. It has certain distinct advantages over the operative procedures. It is safer—there is no undermined skin with impaired circulation, with a potential dead space under it, in an area impossible to keep clean. It is quicker. It entails no dressings, stitches, or other postoperative annoyances to physician or patient, and no hospital expense. It is quite as likely to be enduringly satisfactory, and presents no greater possibilities of trouble.

A PRACTICAL METHOD OF MINIMIZING THE PAIN OF LABOR.

The *New Orleans Medical and Surgical Journal* for August, 1916, contains an article by KOSTMAYER on this subject. His treatment is as follows:

As soon as the pain of the first stage becomes definitely annoying, chloral is given in 10-grain dose and repeated in forty-five to sixty minutes, as indicated, as much as three doses being given, if necessary. When the character of the pain changes to the "bearing-down" of the second stage, morphine ⅛ grain is given by needle, as soon as this pain is severe enough to warrant it. It is rarely necessary to repeat the morphine, though this may safely be done after an hour or two. If labor is retarded in the least, or if in the judgment of the physician labor might safely be hastened, pituitrin is given by needle—say 4 or 5 minims—increasing the second dose, giving 1 Cc. at the third dose, if necessary. As the presenting part begins to dilate the vaginal orifice, ether is given by the open drop method at the beginning of each pain, and continued until the pain subsides.

This method is detailed with no idea of originality, but because it is a simple, safe, and practical means of minimizing the pains of childbirth. It is a big asset to Kostmayer in his obstetrical work, and has added interest and pleasure to the management of maternity cases, upon which he formerly looked with a feeling closely akin to dread.

DEATH AFTER NITROUS-OXIDE-OXYGEN AND LOCAL ANESTHESIA.

In the *British Medical Journal* of July 22, 1916, MCCARDIE states that in a somewhat large experience of nitrous oxide and oxygen anesthesia, with and without the addition of ether, he has never seen any other case like that which he here relates. The patient very nearly died during the operation, and succumbed two hours and a half later without recovering consciousness.

The anesthesia lasted thirty-five minutes, during the last fifteen of which hardly any gas was given but a good deal of air, and a large quantity of oxygen with rebreathing. There was no respiratory obstruction at any time.

Why did this man die? As a comparison McCardie might say that five days previously he had administered gas and oxygen by the same method to an old lady of seventy-two, who appeared to be in worse condition than he, for a severe gall-stone operation; the difference in the treatment was that she had before operation a trifle less morphine, which made her drowsy beforehand. The anesthesia and muscular relaxation were perfect, much less oxygen was necessary than in the case he relates, her color was pink throughout, and respiration and circulation were very good; there was no evidence of shock, although the administration lasted one and a half hours.

Points that occur to McCardie for consideration are:

1. That the circulation failed long before respiration.

2. The failure could not have been due to traumatic shock, because it began before incision.

3. The morphine could not be incriminated, because the patient had had as big or bigger doses before, and was not drowsy before operation.

4. There was no asphyxia from obstruction to respiration, and twice as much oxygen as is usually necessary was inhaled, while very little gas was given.

5. McCardie does not think that death was due to too much gas, because circulatory failure occurred very early, beginning with the administration of the gas.

6. The patient was physically a very curiously nervous man, and McCardie is inclined to think that psychic shock, together with anemia, causing heart weakness, were largely responsible for the fatality. This explanation, he admits, is hardly satisfactory.

7. Why did consciousness never return?

8. Would the early addition of a small quantity of ether to the gases have been of value?

ETIOLOGY OF UTERINE PROLAPSE.

FITZGIBBON (*Surgery, Gynecology and Obstetrics*, July, 1916) as a result of a study of this condition reaches the following conclusions:

Prolapse of the uterus and cystocele are due to damage of the pelvic fascia in the region of the lateral fornices and in front of the cervix.

Prolapse of the uterus must be clearly differentiated from cystocele; they may exist separately or be combined.

Laceration of the perineum and levator ani muscles has no part in the production of prolapse. It allows an increase of cystocele when there is the primary defect.

Retroversion of the uterus has no tendency to produce prolapse.

Prolapse of the uterus and cystocele are analogous to abdominal hernias through scars, due to defective union of the fascia.

The cure of the condition can be effected by reuniting the fascial diaphragm across the pelvis.

The fascial diaphragm can be repaired without interfering with the function of the uterus or dislocating the bladder.

The condition can be treated in exactly the same manner before and after the menopause.

Atrophy of the uterus has no influence upon its support.

Amputation of the cervix other than the removal of a hypertrophied lacerated vaginal portion is not necessary.

TREATMENT OF SYPHILIS IN THE ARMY.

MCGRIGOR (*The Practitioner*, May, 1916) records in the Connaught Hospital over 3000 admissions for syphilis and over a thousand for gonorrhea. There are many old cases declaring that they have been free from all symptoms while in civil life, but that the stress and strain of training causes them to break out again. All cases when diagnosed were treated in the hospital and kept therein until free from manifestations. The average stay in the hospital was a little over fifteen days. About 14 per cent had definite headaches, usually nocturnal. These stopped after the first injection of "606." The first injection of mercury was always given before the "606" injection. A small amount of albumin in the urine is not regarded as a contraindication to the use of arsenic. Some cases were given "606" when the urine was loaded with albumin. The proteid content rapidly disappeared, proving that it was of syphilitic origin. One complete course of treatment was given to all cases, after which the patient was considered fit for active service. One, two or three per cent of all cases treated needed to be readmitted for hospital treatment, the necessity being due in all cases to patches recurring in the mouth probably from excessive smoking, sore gums from too much mercury or neglect to keep the teeth clean. It has happened in one or two cases that the original primary lesion broke down once more after having healed up.

First, as to the preparation of the solution, ordinary tap-water was boiled; in 1

Cc. of this taken at 60° F. was dissolved the contents of the neosalvarsan bulb.

Writing on the same subject French notes that they have treated 60 cases of venereal lesions, syphilitic and non-syphilitic, by means of light, and are of the opinion that it is a great help in cutting short the stay of the patient in hospital. The average saving, in cases of Hunterian chancres and soft chancres, is seven days, and in the cases of deep suppurating buboes of the groin the treatment has diminished their stay in hospital by several weeks. It may be mentioned here that it is absolutely necessary for military patients to be thoroughly healed before they are sent back to any form of duty. The light is a powerful ultra-violet ray, which is allowed to impinge on the affected part from two to three minutes, three times weekly; the distance of the source of light being twelve inches from the patient. The patients so treated have no other external application to the parts, and healing in the majority of cases is very rapid. In phagedenic cases the results are most gratifying; the destruction is arrested, and a healthy, soft cicatrix is formed. A noticeable feature in these cases is the absence of pain after the first application. This loss of pain is of great benefit to the patient, for it is well known how very painful these ulcers are. If the duration of the treatment is limited to three minutes, no erythema of the skin is produced, but it is necessary for the patient to close his eyes, otherwise conjunctivitis will be brought about. The author has been using the Simpson light for the past nine months, and has not experienced any untoward effect.

Patients in whom the S. pallida has been demonstrated are given antisyphilitic remedies, such as salvarsan or galyl and mercury during the light treatment. The chancres of the patients who do not undergo the light are being treated with ung. rubrum (scarlet red), Parke, Davis & Company. This is one of the best of stimulating ointments, and is strongly recommended. Its use has proved very beneficial in cases of tertiary ulcers of the leg, and they have alternated this and the light treatment with success.

The author has been treating a series of cases of cerebral and spinal syphilis with intraspinal injections of mercurialized serum. This serum contains 1/50 of a grain hydrarg. perchlor. in 30 Cc. of sterilized horse serum. A puncture is made in the fifth interspace, and about 30 Cc. of spinal fluid is drawn off. A rubber tube, which is connected with the ampoule containing the mercurialized serum, is then attached to the needle, and the fluid is allowed to pass into the spinal canal slowly, the ampoule being held at a somewhat higher level than the needle. In all these cases they considered it advisable to give a ten days' course of potassium iodide and mercurial inunction before the intraspinal injection. This is done in order to absorb any round-celled infiltration producing endarteritis in the vessels. Three intraspinal injections are given for the course, one weekly. The after-effects are only those usual after lumbar puncture.

"TRENCH FOOT."

WALLER and RIDEAL (*Journal of the Royal Army Medical Corps,* May, 1916) present an article on this subject in which they state that "trench foot" may provisionally be defined as a condition due to prolonged action of water on the skin combined with circulatory disturbance due to cold and inaction.

Water is an abnormal environment for the skin. Theoretically, there are three actions of the water: (1) Loss of heat due to increase of conductivity and thermal capacity of the surrounding medium; (2) effusion of salts from the skin; (3) infusion of water into the skin. A normal skin can, of course, resist these actions, but when the exposure is prolonged and the circulation is diminished the osmotic action may become important. This is proved by experience and by experiments. Fishermen and otter-hunters find that after several hours' contact with cold water there may be some pain, tenderness, and even swelling of the feet, lasting perhaps a day or two. Workers in paper manufactories,

who have to stand for a day at a time in several inches of warm water and paper pulp, have similar symptoms. These are not entirely due to circulatory disturbance.

"Trench foot" is said to occur in cases in which water has been excluded. Experiments were made with various kinds of grease in order to find one which would be impermeable to sweat, and would thus prevent the accumulation of sweat in the sock.

For each ointment tested a control experiment was previously made on the naked hand. The average amount of sweat was three grammes per hour without ointment, and one and a half grammes per hour with ointment.

It is suggested that a salted ointment such as salted lard would be beneficial in protecting the foot against water. The salt would further act as an antiseptic. A liberal amount of ointment would be necessary—*e.g.*, 100 grammes for each leg, with five or ten per cent salt.

All other practical precautions should have been taken, such as foot inspection, so as to insure the men using the ointment, provision of dry socks with the waterproof trench boots, loosening of the puttees, etc.

Officers' spiral puttees contract five to six per cent of their length when they are soaked in water.

THE ETIOLOGY OF CANCER OF THE STOMACH.

LERCHE (*Surgery, Gynecology and Obstetrics*, July, 1916) in a paper on this subject concludes as follows:

Cancer of the esophagus and stomach is peculiarly prevalent among the inhabitants of the temperate climate zone.

The relative frequency with which cicatricial strictures from swallowed corrosive fluids occur in the various parts of the esophagus increases from above downward; in other words, the widest parts of the esophagus are the most frequent sites of such strictures—and for physiological reasons.

Any part of the esophagus and stomach may be the starting-point of cancer with the exception of the pyloric sphincter, which rarely seems to be the primary focus. The organ immediately beyond, namely, the duodenum, is practically immune from cancer. The reason for the latter two phenomena is probably that the ingesta do not reach the pyloric sphincter until they are properly modified.

In view of the foregoing conclusions, it seems logical to look to the ingesta of civilized man for the source of chronic irritation, which leads to malignant changes of the esophagus.

The supposition that swallowed fluids after emanating from the cardia are directed along the "gastric gullet" to the prepyloric region is strongly supported by the fact that the cicatrices from smaller quantities of swallowed corrosive fluids are usually found along this path.

Seventy-nine per cent of cancer of the stomach are also found along this path—the cardia, the "gastric gullet," and the prepyloric region.

As cancer of the stomach follows the "highway of the fluids," it seems logical to assume that ingested fluids in particular may be responsible.

Alcohol and other irritating fluids probably play a part, but in the opinion of the writer "hot fluids," so universally taken throughout the temperate climate zone in the form of coffee, tea, soup, etc., and giving rise to chronic irritation, is the main predisposing cause of cancer of the esophagus and stomach.

Cancer of the esophagus occurs less often in women than in men, because women drink more slowly and take smaller swallows, which pass quickly through, thus saving the esophagus, while the less resistant mucosa of the stomach, where the fluids come to a stop, is more equally exposed in both sexes.

The fact, therefore, that the ratio of cancer of the esophagus in men and women is 3.5 to 1, while cancer of the stomach occurs with almost equal frequency in both sexes, points strongly to "hot fluids" as the important predisposing cause.

This is further substantiated by the results of a comparison between the cancer statistics and the habits of the people in the north and south of Europe, by the relative freedom from cancer of the esophagus and stomach enjoyed by the aborigines of hot climates, and the extremely rare occurrence of cancer of the esophagus in animals.

PREVENTION OF VENEREAL DISEASES IN THE ARMY.

MAY (*The Practitioner*, May, 1916) noting that war is likely to bring in its train a large increase in venereal diseases, responsible, even in time of peace, for a heavy toll on the health and efficiency of the army, attributes this increase to the gathering of enormous numbers of young men into camps away from home influences and to the wave of emotionalism which sweeps away the self-restraint of so many girls and women, this being particularly noted in the early months of the war.

Moreover, to the troops doing garrison duty abroad wide facilities for infection were offered by licensed brothels, especially dangerous from the specious sense of security engendered by their municipal recognition. In spite of these adverse conditions the Royal Commission on Venereal Diseases in their final report state there is no reason to believe that the percentage of infection in the naval and military forces is now greater than in normal times; but there can be no doubt that the total number of infected persons has increased, thus resulting in an appreciable impairment of the army's efficiency.

The principal methods of prevention may be roughly classified as: (1) Educational; (2) diminution of opportunities for exposure to infection; (3) artificial prophylaxis.

Under the heading education is included a descriptive syllabus of gonorrhea and syphilis; the need of early and efficient treatment; insistence on prevention being guaranteed only by keeping out of the way of possible infection; denunciations of the idea that continence is ever harmful; elucidation of the importance of alcohol as a contributing factor; and the need of each man keeping in perfect condition from the point of view of efficiency in the army.

More than 750 lectures have been given to 500,000 troops, and they were well and even enthusiastically received. The education of girls and young women in these matters is an essential complement to that of the men. Several courses of lectures have been given to women social workers under the auspices of the National Council. These lectures deal with the problems of sex, motherhood, and disease, and the audiences consist of rescue workers, nurses, and members of various organizations, such as the Mothers' Union, the National Union of Women Workers, the Parents' National Educational Society, the National Organization of Girls' Clubs, the Y. W. C. A., etc.

These audienecs utilize the knowledge thus acquired to instruct the girls among whom they work. Provision for opportunities for recreation has been of the greatest use in lessening opportunities for exposure. The action of the Liquor Control Board in limiting the facilities for obtaining drink has also had a most beneficial effect.

There are two fairly distinct classes of dangerous women: (*a*) The professional prostitute; (*b*) those who indulge in promiscuous intercourse while following some other occupation for their livelihood. Since the outbreak of the war the latter class has increased considerably in number in the neighborhood of large camps. These girls are often ignorant of the dangers of their mode of life, and may spread disease without being actually aware of their having become infected. Further, the police are naturally diffident about interfering unless they encounter actual indecency, and the darkened condition of the streets and public open spaces afford ample opportunity for clandestine wrong-doing. Some useful work among this class has been done by "women patrols," organized by the National Union of Women Workers.

As regards actual prostitutes, the state of affairs is extremely unsatisfactory. No

organized effort has been made by local authorities, civil or military, to prevent their migration into large military centers. The Women's Police service, working under the joint authority of the Civil and Military Police, have been helpful in lessening this evil and have also been serviceable in protecting children and young girls from molestation.

As to artificial prophylaxis, the experience of the Austrian and German armies seems to show that the provision of various preventive measures diminishes, but by no means abolishes, the incidence of disease.

May proposes the establishment of camps or depots for preventive treatment under medical control, which the men should take as soon as possible after exposure. He expresses the belief that an irrigation of the anterior urethra with two or three pints of a 1:2000 permanganate at a pressure of about 4 feet is practically certain to prevent gonorrhea at any interval after exposure up to twenty-four hours. Calomel ointment 33 per cent seems to be efficient against syphilis. It is strongly advised that the utilization of such measures should be made compulsory by severely punishing all men found to be suffering who have not availed themselves of this treatment.

CAUSE AND PREVENTION OF TRENCH FEET.

HUGHES (*British Medical Journal*, May 20, 1916) describes cases occurring in men who were on duty in a wet sap, who had felt little inconvenience, excepting the feet had felt like pins and needles and had "gone to sleep." There was time and opportunity for one man at a time to sit down and get his feet up.

On coming off duty in the morning they were able to take their boots off, rub their feet, and turn into a dug-out. In some of the dug-outs they could lie at full length, in others they were semi-recumbent. During their sleep, despite the fact that their puttees were off, their socks changed, and boot laces slack, the feet swelled, became red and tender, and the circulation in them was sluggish. The edema was soft and pitted on pressure. On putting on their boots these men were unable to walk.

Hughes calls stage 1 that in which the exudation causing the edema in the foot takes place first of all deep in the plantar fascia and extends to the dorsum of the foot; for the same reason that an inflammatory exudation deep in the plantar or palmar fascia usually manifests itself in edema of the dorsal surfaces. The soles of the feet were very tender to deep pressure.

In stage 2, manifested by men who persevered in trying to do their duty in the trenches, reporting twenty-four hours after the first stage, the foot was swollen and cold and the condition sometimes, though rarely, extended to the ankle, though never above it. Pain was rarely a marked feature. The edema was of quite a different type. there was no pitting on pressure, and the feel imparted to the hand was that of a solid rubber ball. The circulation as tested peripherally was extremely sluggish.

Stage 3 was the last, in which gangrene supervened.

On improving rations and issuing rubber boots in an effort to keep the feet dry there was a distinct improvement. But many patients still reported in stage 1. They were sent to the hospital and returned in ten days, often to relapse.

Hughes in the course of his duties in the trenches finally stopped to rest on a fire-step with his legs hanging down. At the end of three minutes his feet had gone to sleep. There was the sensation of pins and needles, and the feet felt numbed. Thinking this might be a coincidence, he tried it on two successive occasions, only to find the same thing happened each time. After the third time he could not get his boots on. At the end of forty-eight hours' rubbing and elevation the pain had gone. He then established the rule that every man should rest with his feet up. This in combination with proper shelter and proper food abolished "trench feet." He believes two factors act in the predisposition to the

disease: First, fatigue, and second, venous stagnation and consequent exudation of material into the tissues of the foot.

The condition may be classed in three stages, as follows:

Stage 1, or the stage of congestion, brought about by resting, especially after any exertion or long standing, with the legs down. This is brought on more quickly if fatigue is in any way present, as after long standing while on sentry-go, when the lower extremity contains waste products of catabolism, so facilitating exudation from the capillaries into the connective tissue spaces. It will easily be seen how sitting on a fire-step, with the legs hanging down, would favor this, especially where there is some pressure exerted on the popliteal vein.

Stage 2, or the stage of coagulation. Here the exuded material appears to have undergone coagulation. This, again, would be hastened and favored by the presence of toxic catabolic products in the intercellular tissues. The feel of the foot in this condition, like to that of a solid india-rubber ball, coldness, and loss of sensation, marks some radical change between this stage and stage 1. Further, ordinary rubbing and massage seem to have but little influence on this condition, and electric vibratory massage combined with effleurage seem to be the only agents for removing the exuded material.

Stage 3, or the stage of gangrene, is brought about by the pressure of this exuded material on arteries and veins. There is thrombosis in the smaller venules, and such would be hastened by the presence of toxic catabolic substances present.

The whole plan of treatment aims at prevention. If once the condition has progressed to stage 2, then the case necessarily passes out of the hands of the regimental medical officer, and colleagues further down the line can better speak of the treatment of the condition than the writer. The same applies to cases that have progressed to stage 3.

What concerns those who are working in the front line is prevention and the treatment of stage 1, which is the stage of congestion.

Prevention is attained by insisting, whenever possible, that the men while resting should do so with their legs elevated. This cannot too strongly be impressed on officers commanding battalions, the second in command, and especially company and platoon officers. In addition to this, a nightly tour of the trenches, to convince oneself that such recommendations are being carried out, is essential. A daily tour is not necessary from this point of view, as most of the men are sleeping in their dug-outs in the recumbent posture.

One blanket per man should be insisted on, so that the sentry resting at night on the fire-step has two blankets to roll himself in and lie with his feet up on the step.

Hot soup and rum rations are, in the writer's opinion, valuable assets for the general vitality in trench life. Attention to this is all-important in warding off fatigue.

These points seem small and perhaps tending to "spoil the soldier," but in the author's experience they are thoroughly appreciated and call forth better spirit and better work, and have done much to ward off fatigue.

Rubbing of the feet does no harm and may do good, but the good comes from the fact that the men change their socks after doing it.

Hughes repeats that the main points in the prevention are:

1. Keep the feet raised whenever possible so as to prevent stagnation, especially after a period of standing while on sentry-go or in a listening sap.

2. Keep the soldier fit by getting the full calorific equivalent out of his ration, thus keeping the blood-pressure up and "warding off fatigue."

If congestion has occurred, he has always detained the men at the regimental aid post for twenty-four to thirty-six hours. If a regimental aid post has not existed in the part of the line to be held, he has immediately made one, and has always been supplied with a fatigue by the commanding officer to erect it in minimum time. This dug-out will usually accommodate six to eight men, and timely massage with rest

have rendered the men fit to go back to trenches in thirty-six hours. They report each day for three days for further massage, and at the end of this time, with instructions as to the keeping up of their legs whenever possible, the writer had no further trouble.

By this means many men were kept in the firing line who would otherwise have been temporarily lost to the unit, and this is a point the importance of which need not be emphasized.

TECHNIQUE OF SPLENECTOMY.

BALFOUR (*Surgery, Gynecology and Obstetrics,* June, 1916) explores the abdomen through a left Bevan incision. The suggestive frequency with which jaundice, attacks of epigastric pain simulating biliary colic, cirrhosis, and gall-stones occur in many of the diseases for which splenectomy is advocated, necessitates an accurate record of the condition of the liver, gall-bladder, and bile-passages. Such observations will ultimately possess specific value in the elucidation of the obscure but unquestioned intimate relationship between the spleen and the liver.

The dislocation of the spleen from its position against the diaphragm and the left kidney should be the first step in the actual removal of the organ. The separation of the diaphragmatic adhesions can usually be safely accomplished by the fingers. If it is found that the adhesions have acquired blood-vessels of sufficient size to require ligation, it is then even preferable, in most cases, to postpone such ligation (unless the vessels be reasonably accessible) until the spleen has been removed, the bleeding being temporarily controlled by a gauze pack described later. In an occasional case, however, adhesions cannot be stripped with safety, and they must be divided between long curved forceps, care being taken to engage only the adhesions in the clamps. Hartmann and others have advised that the operation be abandoned when these adhesions appear formidable. However, such conditions are not necessarily prohibitive to splenectomy, although in some cases absolute hemostasis has been secured with considerable effort.

Immediately on dislocation of the spleen, a long, hot abdominal pack is efficiently arranged in the space formerly occupied by the spleen until the entire area with which the organ has been in apposition is under firm pressure by the gauze. This accomplishes two purposes: First, and most important, the oozing surfaces are compressed, and, as the bleeding is usually venous, it is controlled without subsequent ligation, if the pack (a point emphasized by W. J. Mayo) is left undisturbed until the actual operation is completed. Second, an excellent support is provided for the safe manipulation and mobilization of the organ, the division of adhesions, and ligation of the main pedicle.

The spleen having been elevated in this manner, its further connections are the main splenic pedicle with its peritoneal investment (the lienorenal ligament), the gastrosplenic omentum, and in splenomegaly of long standing, various adventitious adhesions. The most satisfactory isolation and treatment of the splenic pedicle is obtained by the preliminary division of the accessory adhesions, as well as the peritoneal attachments and reflections. The gastrosplenic omentum should first be divided, in sections as close as possible to the spleen, between ligatures. The only named vessels encountered are the vasa brevia, which arise from the splenic artery at variable points, pass to the greater curvature of the stomach, in this peritoneal fold, and finally anastomose with the left gastroepiploic. In dealing with the upper edge of this gastrosplenic omentum, it must be remembered that here the fundus of the stomach is normally in very close apposition to the spleen. It is necessary, therefore, always to determine the exact relationship and protect the stomach from injury in its separation from the spleen. In an earlier experience the author accidentally included in a clamp and excised a small area of the wall of the

stomach, the resultant opening, however, being readily closed without postoperative complication. At the lower pole of the spleen there is an occasional fibrous attachment, derived from the phrenocolic ligament, which with the other adhesions should be separately ligated.

The spleen may now be further mobilized by careful dissection of the peritoneal and fibrous coverings of the splenic pedicle. The localization of the tail of the pancreas is the important feature of this mobilization, and as the relationship of the organ is not constant it is necessary to inspect it in all cases. In some instances the tail is short, lying against the renal surface of the spleen, on the posterior aspect of the pedicle, and it may be fitted so closely into the hilus of the spleen as to have acquired a concave edge. In other cases the tail is attenuated, it is in front of the splenic vessels, and in contact with the gastric surface, while often it does not extend into the operative field.

With the reflection of the lienophrenic ligament a better exposure is obtained of the tail of the pancreas; it can be detached from its original position by dissection and allowed to drop back from the hilus of the spleen.

Therefore, after such dissection the splenic pedicle consists, from a surgical standpoint, of the splenic artery and its veins. The artery in some instances has divided before reaching the hilus of the spleen, although it often continues as a single trunk well into the hilus, while the veins are always in two or more branches. The latter do not bear a fixed position as regards the arterial trunks, lying in front in some instances, and behind in others. They are distinctly larger than the artery itself, and their extreme friability must always be considered. The arrangement of the vessels of the pedicle is fan-shaped, the breadth varying in different cases.

At this point it is possible to decide whether it is best to treat the pedicle *en masse* or to ligate it in sections. The latter method is to be preferred, and the dissection of the pedicle is usually most advantageously carried out on its posterior aspect, with the spleen tracted toward the midline. The extent to which the spleen can be lifted out of the abdomen by careful traction is surprising if, following the division of the peritoneal and fibrous investments of the pedicle, certain of the lateral venous trunks are separately isolated and divided between ligatures. It should again be emphasized that caution must be exercised in the degree of traction to which the pedicle is subjected and in the dissection of these veins. It is chiefly because of the normal tortuosity of the splenic artery that this elongation of the pedicle is possible, thus facilitating its secure ligation. Where it is possible it is advisable to first secure the arterial supply, so that the spleen may partially empty itself of its contained blood through the unclamped veins before these are ligated.

If, on account of the arrangement of the veins and arterial branches, ligation in sections is not advisable, ligation *en masse* by the two-clamp method will prove a satisfactory and safe method. Two curved clamps are arranged on the pedicle with a third clamp on the splenic side to control "back bleeding," and the spleen is removed. A double strand of No. 2 plain catgut is tied with moderate tension in the crushed line of the inner clamp as a partial control, and a second strand is transfixed below the distal forceps as the actual control.

Having made certain, by either of these methods, that the pedicle is securely ligated, the large hemostatic pack is removed, the newly exposed surfaces inspected, any oozing points being separately secured by fine catgut on a needle, and absolute hemostasis assured.

The disease or condition for which splenectomy is done governs largely the technical difficulties and risk of the operation. In pernicious anemia the removal of the spleen can be accomplished with comparative ease and safety. Although enlargement of the organ has been present, adhesions are few and usually insignificant. The pedicle is as a rule small, and its treatment is not often complicated by the rela-

tionship of the pancreas. Furthermore, the risk of the operation in this disease can be minimized by intelligent preoperative treatment and observation, as well as by the careful selection of cases.

There must be a rational basis upon which splenectomy in pernicious anemia is advocated, as well as strict recognition of the limits of operative safety. Splenectomy is definitely contraindicated during an acute crisis, or in a period when the patient shows a steady decrease in hemoglobin and red blood-cells, or when mental torpor, cord changes, and edema mark the terminal stages of the disease. Repeated transfusions from a suitable donor will frequently carry the patient through most critical exacerbations of the disease, and the proper interpretation of the reaction following transfusion is essential. Further, it is important that a satisfactory donor be available after operation.

In splenic anemia, splenectomy is associated with a higher operative risk and greater technical difficulties than it is in any of the more common diseases of the spleen. In the cases seen by the author the spleen has been usually of large size, the vessels friable, and adhesions occasionally troublesome. Patients in the late stages of the diseases are prone to develop fever, ascites, cirrhotic liver, or severe anemia, which conditions contribute to the seriousness of the operation. The only instance in which the writer thought it inadvisable to attempt splenectomy was in splenic anemia with great ascites, atrophic cirrhosis, and aneurismal splenic vessels. The friability of the veins in this disease was especially demonstrated in a baby 22 months old, upon whom the author performed splenectomy for typical splenic anemia of the adult type.

The operation in hemolytic jaundice is of relatively little risk, and there has been no particular difficulty in the removal of the spleen, although the organ is occasionally very large. It is, however, most important to avoid splenectomy during an exacerbation of the symptoms. Of the cases the author has seen of this disease, the only operative death occurred in a patient in whom he failed to realize the import of a subacute and subsiding acholuric crisis.

In those cases of cirrhosis of the liver associated with splenomegaly, in which splenectomy is to be considered, the spleen is often firmly adherent, and this fact, together with the poor general condition of the patient, makes the operation rather hazardous. Nevertheless, in the cases selected for operation there has been no operative mortality; and in two cases most striking benefit has thus far followed the removal of the spleen.

In the rarer conditions, such as syphilitic spleen and idiopathic splenomegaly, the operation itself is not of great risk. It has been interesting to note the result of splenectomy in two cases of splenomegaly with specific history and positive Wassermann. In both of these it had been previously possible to obtain a negative Wassermann by salvarsan, but it would become positive on discontinuing the treatment. Since splenectomy the Wassermann has remained negative.

From the author's own experience he has found that the features to be emphasized in the technique of splenectomy are: (1) The abdominal exploration; (2) the dislocation of the spleen; (3) the use of a hot gauze pack; (4) the protection of stomach and pancreas from injury; (5) the preliminary ligation of adhesions; and (6) the treatment of the splenic pedicle.

DEAFNESS DUE TO SYPHILIS.

ROBERTS (*Journal of the Missouri State Medical Association,* April, 1916) discusses two forms of deafness: (1) Paracutic deafness; (2) nerve or labyrinthine deafness. He uses the term paracutic because it is descriptive of the symptomatology; the pathology has yet to be worked out.

Paracutic deafness is that form in which the patient is able to hear ordinary conversation best when in a noisy place; can carry on a conversation in the usual low tone on a street-car or in a noisy place and hear distinctly every word; but when in a quiet

room hears very poorly, or it may be necessary to shout to make him understand.

This form of deafness comes on gradually, is bilateral, and usually more pronounced in one ear than in the other. Some degree of this form of deafness includes at least 25 per cent of all people who are chronically deaf without a history of suppuration and between the ages of twenty and forty.

Beck, of Vienna, was the first to call attention to shortened bone conduction with a normal air as significant of lues. It was also determined that any disease which produced increased pressure in the posterior fossa of the brain gave the same bone conduction. Notwithstanding this it is a valuable test and an aid in diagnosis.

No one has called attention to a short air conduction with normal or increased bone conduction as significant of syphilis when accompanied by paracusis.

Mr. Heath, of London, has described the pathology rather indefinitely as a relaxation of the ear drum ossicular chain, middle-ear muscles, and membrane of the oval window. He gives as one of the main etiologic factors a too forcible blowing of the nose, causing great pressure through the Eustachian tube into the middle ear, producing a distention, relaxation, and eventually an atrophy of the drum and middle-ear structure.

Up to the present time he has submitted eleven cases to spinal-fluid tests for lues. Of these nine were reported positive to Wassermann and gold chloride; one positive to gold chloride, negative to Wasserman.

Paracutic deafness usually begins between the ages of fifteen and thirty, comes on gradually, and under former methods of treatment grows progressively worse. Patients usually do not complain of paracusis, and when questioned will say they had observed that they heard best in a noisy place, but had thought it due to the other person speaking more loudly, and only after a careful test for themselves were they convinced that they were paracutic.

They complain of a high-pitched tinnitus and autohypercusis; that is, they speak in a low tone and are hard to understand, their own conversational voice sounding very loud to themselves.

The family history usually shows that some other member of the family has impaired hearing, more often a brother or sister than a parent.

The physical findings are not very important. Inspection of drum in early cases shows nothing characteristic—in fact, the drums are very similar to the drums in chronic otitis media non-suppurative.

The etiology of this class of cases is syphilitic in from 80 to 85 per cent, and congenital in nearly all. For the other 15 or 20 per cent, if not syphilitic, it is difficult to give a cause, but certainly they are not catarrhal.

As to the pathology, it is probably a syphlitic periostitis or ostitis in the capsule of the labyrinth. When it begins near the oval window and produces a thickening and infiltration of periosteum there will necessarily result some degree of stapedial fixation. The process, of course, may progress and involve the cochlea, vestibule, and semicircular canals, their capsules and contents, and nerve deafness will result.

If the case comes under observation, is diagnosed and properly treated while bone conduction is still increased, he believes there is some chance for improvement in hearing. If, however, it has progressed to a stage of shortened bone conduction showing nerve degeneration, the prognosis is unqualifiedly bad for functional improvement.

THE TREATMENT OF RETROCECAL APPENDIX.

SHAW (*Annals of Surgery*, June, 1916) states that the difficulties encountered in the removal of a retrocecal appendix at times transform an otherwise simple operation into one almost formidable. The incidental trauma, possible injury to the great vessels and ureter, hemorrhage and deperitonealization, coupled with the danger of rupture to the appendix or its mesentery, etc., certainly call for oper-

ative measures more finished and more surgical than digging it out in the blind.

We have at our command a simple, clean, bloodless technique with which we can render the delivery of a retrocecal appendix a finished anatomicosurgical procedure—*i.e.*, the mobilization of the cecum and delivery of the appendix under sight.

The following summary shows the chief etiological factors in placing and retaining this type of appendix in its retrocecal position to be: First, the influence of peritoneal adhesions established during the descent of the cecum from its subhepatic position to the iliac fossa. Second, the inherent curve of the fetal pouch. Third, the unequal development of the pouch.

The appendix may be found in any part of the abdomen; this is due to numerous etiological factors, more especially to conditions of arrested development of the colon. However, in this brief paper the author states he does not wish to confuse the issue by the injection into the subject of any of the multifold varieties of aberrant appendices, except the retrocecal, and then only to that type of retrocecal appendix associated with a cecum whose descent is more or less complete, or at least in a subhepatic position. However, with a careful consideration of the relational anatomy, the suggested technique may be applied in principle to any case.

When retrocecal, the appendix must of necessity lie to the right of (external) or, in rare cases, beneath (posterior) the mesocolon; this point is of great importance when we come to consider the blood supply and the factors in delivery which are productive of hemorrhage.

The appendix may be primarily adherent to either the parietal peritoneum or to the posterior visceral peritoneum of the cecum and colon, and, after fusion of the parietal and visceral peritoneum occurs, it becomes hermetically sealed. Where fusion has not taken place (26 per cent of cases) simple manual rotation of the colon inward will reveal the appendix adherent to the visceral peritoneum of the cecum, and by incising the peritoneum external and lateral to the antimesenteric border of the appendix to avoid severing vessels of the mesoappendix, it will usually free easily from its visceral attachments by dry gauze dissection from without inward.

In that rare type of cases in which the colon has not fused, the retrocecal appendix is rare and, if it occurs, is generally adherent to the colon and not the posterior parietes primarily. However, a chronic appendix held in this position usually adheres more or less in time, simulating developmental fusion.

It would seem apropos to the writer to digress sufficiently at this point to suggest the diagnostic points necessary to determine the position of an aberrant appendix—*i.e.*, (*a*) careful survey of the cecum (with the embryology thereof in mind), (*b*) noting the relative size and position of the terminal sacculi, (*c*) its topographical peritoneal relations, (*d*) the degree of descent, (*e*) its position relative to fixed landmarks, (*f*) associated conditions both pathological and developmental, (*g*) the direction of the terminal portion of the longitudinal bands, and (*h*) careful palpation. These are all factors of primary importance in determining the position of the appendix. (Especially practical is the pointer in reference to the direction of the longitudinal bands.)

By keeping in mind the etiological factors in arresting and maintaining *in situ* the retrocecal appendix, how elementary it would seem to simply reverse the order of their occurrence (*i.e.*, first, adhesion; second, fusion), and, first, mobilize the cecum and portion of the colon necessary for exposure, then, secondly, under sight separate adhesions and deliver the appendix.

The mobilization of the colon is a simple, clean, bloodless, and accepted surgical procedure.

The delivery of the retrocecal appendix in this manner has proven simple and logical. This method is mentioned by Vosburg and possibly by others, but he does not claim it as original. However, this much is sure, that the procedure is by no means common, generally understood, or

adopted, and at the expense of reiteration the writer wishes to adduce his personal approval, believing that the delivery of a retrocecal appendix by mobilization of the cecum (and colon when necessary) is certainly a distinct step in advance over the dangerous unsurgical technique of digging them out in the blind, and will certainly bear repetition and reëmphasize a most important procedure.

Believing the subject of developmental anatomy of the gastrointestinal canal and the accepted and conventional facts in regard to varieties and etiology of aberrant appendices are not proper subjects for review in current literature, the author has endeavored to encroach upon the time of the reader only sufficiently to state certain basic truths, just enough to establish a rationale for the procedure advocated.

PREGNANCY IN THE TUBERCULOUS.

NORRIS (*American Journal of Obstetrics and Diseases of Women and Children,* June, 1916) concludes an excellent article on this subject as follows:

The combination of pregnancy and pulmonary tuberculosis is a common one.

Pulmonary tuberculosis exerts little or no influence against conception.

Pulmonary tuberculosis exerts but little influence on the course of pregnancy, and except in the advanced stages exerts little or no influence toward causing abortion, miscarriage, or premature labor.

About 20 per cent of mild quiescent pulmonary tuberculosis and 70 per cent of more advanced cases exhibit exacerbations during pregnancy or the puerperium.

Marriage is worse for the tuberculous woman than for the tuberculous man owing to the dangers incident to pregnancy.

Unless the pulmonary lesions have been quiescent for a moderately long period, tuberculous women should not marry.

Tuberculous women should not become pregnant unless the disease is in the first stage, and has been quiescent for a minimum period of two years.

It is as yet impossible to determine with certainty which case will bear the added strain of pregnancy well and which badly. We must individualize our patients. Moderately extensive lesions, recent activity, the development of secondary lesions, especially laryngeal involvement, loss of weight, fever, hemorrhage, sweats, lack of vigor, inability to obtain proper treatment, are ill omens, whereas the reverse are more favorable.

Prior to the fifth month of pregnancy, the uterus should be emptied if the disease manifests any evidence of becoming active. Curettage during the first six or eight weeks, and in the later cases vaginal hysterectomy, are the preferable methods. Interruption of pregnancy does not insure an amelioration of the pulmonary condition, but does greatly improve the prognosis. About 65 to 70 per cent of cases, prior to the fifth month of pregnancy, will be definitely improved by emptying of the uterus as soon as acute symptoms arise, provided that proper after-treatment is carried out. Late intervention, that is, after a week or more from the onset of the exacerbation, has given less satisfactory results. Sterilization is rarely justifiable.

After the fifth month of pregnancy, it is generally advisable to treat these patients expectantly. Labor should be made as easy as possible. For this end, induction of premature labor two weeks before term is often advisable; rarely, if ever, should they be allowed to go beyond term. At labor forceps or version is usually indicated.

Infants should not nurse tuberculous mothers, and should be especially guarded from infection.

Hygienic and dietary treatment should be employed at all times. These patients should be kept under close observation, and should be examined by a competent internist at regular and frequent intervals.

In the great majority of cases the tuberculosis precedes the pregnancy. Even in those cases in which the symptoms are first observed during pregnancy, infection has generally occurred prior to conception, and an exacerbation during pregnancy has directed attention to the pulmonary condition.

PERFORATING AND PENETRATING WOUNDS OF THE CHEST WITH SEVERE HEMORRHAGE.

DON (*British Medical Journal*, June 10, 1916) advises prompt treatment of chest wounds accompanied by marked and persistent bleeding. He makes a stab through an intercostal and slips the outer covering of a tracheotomy tube along the blade of the knife into the pleural cavity. Air enters and blood is coughed out. The tube is turned so that the inner end points up and is fixed by straps. The treatment has for its principle the production of a hemothorax, supplemented by drainage of the clot, which in military practice practically always becomes infected.

The advantages of this treatment are that the lung collapses quickly and any wound in it immediately closes.

The lung gets complete rest for a time and will be better able to combat infection later, as it will contain very little blood effused into its tissues.

The suction force of respiration is immediately removed from the rents of the intrathoracic vessels, and clotting and natural arrest is allowed to take place.

Plugging may be done for hemorrhage from the chest wall with a certainty of arresting it and of doing no harm, and there will be less movement—a comparative rest—on the collapsed side.

TENDON TRANSPLANTATION.

MAYER (*Surgery, Gynecology and Obstetrics*, March, 1916) notes that a physiological tendon operation must conform not only with the general surgical principles of absolute asepsis, minimal hemorrhage, and minimal traumatism, but also with the following demands:

It must wherever possible restore the normal relationship between the tendon and the sheath.

The course of the tendon from its original site to that of the paralyzed tendon must run through tissue adapted to the gliding of the tendon. Injury to the periosteum or the crude boring of a hole through fascia or interosseous membrane is inconsistent with this demand.

The normal insertion of the tendon must be imitated wherever possible by implanting the living transplanted tendon directly into bone or cartilage, preferably at the insertion of the paralyzed tendon.

The normal tension of the transplanted tendon must be reëstablished and the physiological length of the transplanted muscle thus maintained.

The line of traction of the transplanted tendon must be such as to enable it effectively to do the work of the paralyzed tendon.

As an example of technique he describes an operation indicated only in cases of comparatively slight paralytic valgus, since the extensor proprius hallucis, even on the assumption of its functional hypertrophy subsequent to the operation, is not strong enough to replace the tibialis anticus.

The first skin incision, 4 cm. long, bowed with the convexity toward the sole of the feet, is made over the insertion of the tibialis anticus.

The tendon of the tibialis anticus at its insertion is slit longitudinally for 3 to 4 cm., and the bone or cartilage of the internal cuneiform is grooved for the reception of the extensor tendon.

The incision over the extensor proprius hallucis tendon runs in the line of the tendon from a point 3 cm. above the tip of the internal malleolus to the middle of the first metatarsal bone. The reason for this long incision is evident, when the sheath of the tendon has been opened; then it is seen that the mesotendon attaching the tendon to the floor of the sheath is too well developed to allow withdrawing the tendon from the sheath through a small supramalleolar incision.

It is well, however, not to expose the tendon unnecessarily at this stage of the operation, but to leave it *in situ*, until all has been made ready for transferring it into the sheath of the tibialis anticus.

This transfer requires an accurate knowledge of the fascial relations between the two tendons. A diagrammatic cross-

section through the calf about 5 cm. above the tip of the malleolus shows the three anterior muscles of the calf lying within the same fascial compartment. A cross-section three centimeters distal to the first shows the extensor proprius hallucis and the tibialis anticus divided from one another by a fascial septum derived from the fascia cruris. To run the extensor hallucis through this fascial septum would not be physiological. On the other hand, freeing the extensor hallucis to the level of the first cross-section, where both muscles lie within the same fascial compartment, would involve sacrificing many muscle fibers and important blood-vessels, since the origin of the extensor hallucis extends downward almost to the level of the malleoli. Fortunately, nature has indicated a suitable path. At one point, usually about 2 cm. above the malleolus, the septum separating the tendons is so thin as to be transparent. This is the site of election. Here the operator can draw the extensor tendon into the sheath of the tibialis anticus, confident in the knowledge that serious postoperative adhesions will not result. Since this point lies slightly above the upper pole of the extensor hallucis sheath, the fascia over the extensor must be incised for 2 to 3 cm. proximal to the sheath. The mesial fascial edge is grasped with the clamp and raised until the operator sees this thin portion of the septum. Here a small incision is made directly into the tibialis sheath. An eye-probe is passed through this incision in the line of the tibialis tendon, made to puncture the lower end of the sheath, and to appear over the insertion of the tendon.

The sheath of the extensor hallucis tendon is then slit open its entire length. The tendon is divided near the middle of the metatarsal bone, its end grasped with the tendon clamp, and the mesotendon divided close to the tendon until the operator reaches the lowermost muscle fibers. The vessels of the mesotendon are thus sacrificed, but a large vessel which runs through the lowermost muscle fibers can always be spared. The tendon end is threaded with chromic catgut by the stitch, the free ends of the suture are passed into the eye of the probe and the tendon thus readily drawn through the sheath of the tibialis anticus.

Withdrawing the tibialis anticus tendon from the sheath as first advocated by Biesalski produces needless trauma and is unnecessary, since the sheath does not closely invest the tendon, but is large enough to accommodate two tendons.

Fixation of the tendon. Here the knowledge of the laws of tendon tension is important, since otherwise the operator is likely to sew the tendon under too great tension and thus throw an unnecessary burden on the transplanted muscle. When the muscle is relaxed under narcosis and its origin and insertion are approximated, the tendon itself, as well as the muscle fibers, have a zero tension. Therefore, to give the transplanted tendon the exact physiological tension, one must merely approximate the origin of the muscle and its new point of insertion (in this instance, by holding the foot supinated and flexed dorsally), draw the tendon downward until it runs in a straight line, and suture it under just sufficient tension to maintain this desired course. With a little experience the operator knows beforehand just how long the tendon must be to reach its new point of insertion, and the chromic gut suture, inserted to draw the tendon through the sheath, can thus be used as the fixation suture.

The implantation site has already been prepared by slitting the tibialis tendon lengthwise and traumatizing the periosteum of the internal cuneiform. The tendon, threaded by the fixation suture, is now fastened securely between the two halves of the tibialis tendon. The sutures are threaded on a stout cervix needle or an instrument resembling a shoemaker's awl, and are passed through bone or cartilage, ligament, and fascia. The fixation must be mechanically fast. When properly executed it can withstand a traction of 20 to 30 pounds.

This mechanical fixation does not, however, meet the physiological demand, for firm though the suture is at the time of

operation experimental work has shown that such a suture produces a necrosis of the tendon, and therefore there is a possibility that subsequently the tendon may slip from its moorings. This slipping, however, is prevented by suturing the paralyzed tibialis tendon over the extensor hallucis. In this way the living tendon cells of the extensor proprius hallucis above the fixation suture are brought into direct contact with the periosteum and with the tendon of the tibialis anticus. Thus the fixation is rendered physiological as well as mechanical, for in the healing process, even though the tendon distal to the fixation suture necroses, an intimate union above this point is bound to occur between the tendon and the traumatized periosteum.

The distal stump of the extensor tendon is fastened to the adjacent tendon of the extensor longus digitorum, the fascia is closed, and thus the normal ligaments of the foot are restored. The skin incisions are closed without drainage.

GUNSHOT WOUNDS AND INJURIES OF THE SPINAL CORD.

COLLIER (*Lancet*, April 1, 1916) observes that in nearly all the cases the initial clinical picture is that of a total lesion of the cord. The early reappearance of the plantar reflex, if lost at first, and the change from the flexor to the extensor type soon after the seventh day, or the presence of an extensor response earlier than this, are certain indications that the lesion is partial and that some recovery will occur. Persistent loss of the plantar reflex and long-lasting flexor response are indications that the lesion is severe and that useful recovery is highly improbable. Early return of the knee-jerk and of the ankle-jerk is of good prognostic import. Even in the less severe cases the knee- and ankle-jerks do not return before the fourth day, and their reappearance before this date gives hope that complete recovery may occur. Colonel Gordon Holmes is of opinion that the presence of an extensor response is a certain indication that the lesion is incomplete. These remarks apply to each leg individually. The condition of the reflexes on one side has no bearing on the recovery of the opposition limb. The further prognostic indications are simple. They depend upon the date of return and the rapidity of return of sphincter control, of sensibility, and of motor power. Early return of sphincter control is one of the best of signs. In two cases in which recovery has been complete, and in two other cases in which recovery has been nearly complete, some sphincter control returned within a week of the injury.

SURGICAL TREATMENT OF ACUTE EPIDIDYMITIS.

MCKENNA (*Urologic and Cutaneous Review*, June, 1916) observes that in acute epididymitis we find the beginning of a hydrocele in the fluid around the testicle, and consequently the fascia investment of this gland under great tension. Hence simple division of this fascia will often greatly relieve pain. The question always arises as to whether the patient is more likely to be made impotent by opening the epididymis than by allowing the inflammation to run its course. The epididymis is described as a canal or tube, made up of transverse chambers. When the epididymis is acutely inflamed, the tube stands out so clearly that McKenna believes the operator can easily puncture the posterior wall of the affected chamber without doing any injury to the small tubules coming off from the testicle.

In operating upon a number of cases for short circuit of the vas deferens, the lowest part of the epididymis showed the seminiferous tubules to be closed, and this part of the epididymis to be a hollow tube without any spermatozoa; on further examination the tubules coming from the testes were seen to be blocked. This, of course, was due to the infection at the time of the acute condition not being relieved by operation.

Since this is the result, it would seem that the patient would be less apt to be

sterile if the pus were drained off before stenosis could take place. Many patients who suffer with acute epididymitis, and are treated in a palliative manner, afterward are capable of passing living spermatozoa. This, of course, is due to the lessened amount of inflammation in the epididymis and the amount of free pus in the vas, which is absorbed by nature at the time of the infection. The only good reason for operating in this class of cases is incident to the excruciating pain that they suffer at the time. The intensity of pain is indicative of the amount of pus in the epididymis and the amount of inflammation surrounding the testicle.

Eleven cases were treated in different ways for the relief of pain—the first four by cutting down on the epididymis and putting a gutta-percha drain in the lumen, an operation obviously requiring a manipulative deftness beyond the reach of the ordinary surgeon. These four cases were greatly relieved of pain, but it was from fourteen to twenty-one days before the entire swelling was relieved. In four cases the epididymis was exposed by careful dissection and the different fascias divided one from the other and the epididymis drained. In these cases the patients were entirely free from pain, and the wound healed and the swelling disappeared within eight days. In two cases the dissection was made complete and the fascias separated from each other, and the epididymis was not punctured for two days. Both cases had immediate relief from the general pain, but complained of a sharp toothache-like pain in the testes. In the last case the incision was made on the opposite side, allowing the free fluid to escape from the tunica vaginalis. In this case the patient was greatly relieved of pain, but not entirely so. Two days later with a local anesthetic the epididymis was opened and drained and the patient entirely relieved of pain.

A blind stab operation is not to be recommended, because it is quite difficult to do this operation and be sure to separate the posterior wall of the epididymis without plunging the knife into the tubules coming off from the testicle on the opposite side.

Surgical procedure is only necessary when the patient is suffering excruciating pain.

When this procedure is carried out, it is quite necessary to divide the fascias so as to free the tension from the testicle as well as the epididymis. Patients are less apt to be impotent if the posterior wall is divided carefully and the pus drained off than if it is left to nature to absorb.

It is not necessary to split the entire epididymis, but only the infected chamber, which stands out clearly.

REVIEWS.

SYPHILIS AND THE NERVOUS SYSTEM. For Practitioners, Neurologists, and Syhilologists. By Dr. Max Nonne. Authorized Translation by Charles R. Ball, M.D. Illustrated. Second Revised American Edition. J B. Lippincott Company, Philadelphia, 1916. Price $4.00.

There was no field in therapeutics twenty years ago about which so little was known and in which so little could be accomplished as the field of diseases of the nervous system. It is true that occasionally remarkable effects were produced in cases of gumma of the nervous system, and in certain other lesions arising from syphilis, by the administration of the various mercurials or iodides, but, nevertheless, the physician who found himself face to face with definite manifestations of syphilitic disease of the nervous system had to admit that the proposition before him was difficult and the prognosis unfavorable. The rapid advances which have been made since then in our knowledge of the parasite which causes syphilis, and of its existence in the perivascular spaces many years after the primary lesion has taken place, have done much to clarify our conception of the changes which are present, and the various tests which have been made to determine that the syphilitic virus is still active render the diagnosis certain where before it was

uncertain, and so permit much more direct treatment, which has further been amplified by the introduction of the newer arsenical compounds and by the employment of so-called salvarsanized serum.

The appearance of the third German edition of Nonne's work in the form of a second edition of the American translation is, therefore, most timely, because this subject is one in which we need a complete summing up of our present knowledge and also because the general practitioner is possibly quite as frequently called upon to treat nervous syphilis as is the neurologist. Not infrequently the general practitioner is so much at a loss as to diagnosis and treatment that he refers his patient to the neurologist, and afterwards finds that with a little more knowledge, which he could gain from a book such as this, he could have made a satisfactory diagnosis, both from the standpoint of the consulting room and the laboratory, and have applied proper measures for relief.

In the present volume the most notable changes from previous editions naturally consist in the chapters on Paresis, Tabes, and Serobiological Reactions, and Therapy.

After a preliminary consideration of our knowledge of syphilis of the nervous system and of the prevalence of this disease, as well as a discussion of the specific organism and the methods of infection, Nonne proceeds to a consideration of the pathological changes induced by the spirochete, both in the nervous tissues and their supplying blood-vessels with the symptoms which are commonly or uncommonly manifested as a result of the invasion. He then discusses Syphilis, Cerebrospinal Meningitis, and every other aspect of nervous syphilis, with a chapter upon Specific Basilar Meningitis, as well as a chapter upon the Symptomatology of Syphilis of the Base of the Brain, the Neuroses and Psychoses of Syphilitics, Syphilis of the Spinal Cord and its Membranes, and then takes up Syphilitic Diseases of the Peripheral Nerves and Hereditary Syphilis Affecting the Nervous System, followed by a chapter Concerning the Behavior of the Wassermann Reaction in the Blood and Spinal Fluid, including the Globulin Test, Luetin Reaction, and cognate subjects. The eighteenth chapter deals with The Prophylaxis of Nervous Syphilis; and the last, or nineteenth, chapter with Salvarsan Therapy: Concerning its Methods of Administration, its Effects in General and on Definite Lesions, with a discussion of the Administration of Mercury with Salvarsan.

The type used is large, well spaced, and, therefore, the text is easily read. As we have already pointed out, the volume is a notable contribution to modern medical literature, and the translator deserves much praise for the skilful way in which he has carried out his work and for placing in the hands of his medical confrères so excellent a summary of a useful German text.

THE TREATMENT OF DIABETES MELLITUS. By Elliott P. Joslin, M.D. Lea & Febiger, Philadelphia, 1916. Price $4.50.

There is probably no one in this country whose name is more closely and more favorably associated with the investigation of this extraordinarily complex malady than Dr. Joslin, whose contributions to its investigation are universally recognized as of the greatest possible value and whose opportunities for research have been admirable. The present book is based upon 400 fatal cases and 600 patients who are still living. The author makes the encouraging statement that while three years ago he would not have wished to write a book upon this subject, to-day it is a pleasure and an inspiration because the improvement in treatment is beyond question, which practically means that he indorses to a large extent the employment of fasting and exercise in the treatment of diabetes, as suggested by Dr. Allen. Dr. Joslin states that the mortality of his patients has been diminished twenty per cent during the year by the application of this plan. More encouraging still is his statement that the so-called acutely fatal diabetes is disappearing under modern methods. Dr. Joslin also gives us the interesting statement that he believes that there are more than five hundred thou-

sand individuals with diabetes in the United States. It is also important to note that he recognizes the difficulties which exist in carrying out a prolonged plan of treatment by any patient, and particularly by diabetic patients. In other words, both the practitioner and the patient must clearly understand the reasons for a Spartan life.

We have already called attention in the GAZETTE to the fact that while Dr. Allen's treatment is applicable in a large majority of cases it is not applicable in all, and Dr. Joslin has recently published papers which show that, like every other therapeutic measure, the so-called starvation plan is not universally applicable in rigid detail to all cases.

As the book covers nearly four hundred and fifty pages it may be considered an exhaustive consideration of a very important subject, in which the author not only presents his own views and results but also those of other workers who are generally recognized as being worthy of emulation. Aside from giving excellent descriptions and tests it also provides much information which the practitioner can immediately and readily apply to patients who may be under his care suffering from this so-called disease.

THE PROBLEMS OF PHYSIOLOGICAL AND PATHOLOGICAL CHEMISTRY OF METABOLISM. By Dr. Otto Von Fürth. Authorized Translation by Allen J. Smith, M.D. J. B. Lippincott Company, Philadelphia, 1916. Price $6.00.

As may be gathered from the title of this book it deals by no means with simple problems in physiology, but with some of the most complex problems with which modern physiologists and physiological chemists have to deal. It contains twenty-five chapters. After an Introduction to the Study of Metabolism and Protein Digestion in the Stomach, it considers The Proteolytic Pancreatic Ferment, Protein-Digestion in the Intestine, Proteolytic and Peptolytic Tissue Ferments, The Excretion of Aminoacids, The Physiology of Purin Metabolism and Its Pathology, Digestion and Assimilation of Carbohydrates, The Various Types of Diabetes, Natural and Induced, The Relationship of the Glands of Internal Secretion to Carbohydrate Metabolism, Sugar Destruction in the Economy, The Digestion and Resorption of Fats, Fat Splitting Tissue Ferments, Acetone Bodies, Nutritional Requirements, The Technique of the Study of Gas Exchange, Oxidation Ferments, The Coloring Matter of the Blood, Blood Gases, and last of all the Metabolic Conditions which Exist in Connection with Fever. Altogether the book covers nearly seven hundred pages, but the type and leading is unusually large, so that it is not so great a mass of text as the number of pages would indicate. Almost every page contains multiple references as foot-notes. This book will prove useful, in the form of its translation, to English-speaking physiologists and physiological chemists, and among these it will doubtless attract much attention. There is much in it that will interest the general medical man, particularly if he has leanings to the laboratory. The text is, however, too technical to attract the busy practitioner, who will be content to rely upon his text-book of physiology for the meagre information which he thinks he needs along these lines, but who, if he wishes to gather any information over and above that found in the ordinary physiological text-book, will be glad to refer to this perfect mine of information concerning comparatively recent, but nevertheless most fruitful, fields of investigation.

A TEXT-BOOK OF PATHOLOGY. By William G. MacCallum, M.D. Copiously Illustrated. W. B. Saunders Company, Philadelphia, 1916. Price $7.50.

This book, which is fully as large if not larger than the work upon Pathology written by Delafield and Prudden, is an able presentation of one of the important departments of medicine, not only for the medical student but for the practitioner. The latter is too much inclined, after he leaves his medical school, to ignore the fundamental branches of medicine, with the result that his conceptions of disease become impaired.

So many advances have been made in our knowledge of pathology or morbid physi-

ology that the graduate of a decade ago, as well as the graduate of two or three decades ago, is generally much behind the times in his conception of the conditions which exist in a given patient, and this book, which is a most scholarly presentation of what can be made an uninteresting subject by an unskilful writer, is to be welcomed not only for its own worth, but because its attractiveness will increase knowledge concerning the subject with which it deals. A sufficiently large bibliography is appended to each chapter to enable the reader to look up the original articles, if he so desires, and the text and illustrations are of such a nature as to make the book useful, not only for study but also for employment in the post-mortem room in the determination of the character of lesions which may be found. The book is handsomely printed and the illustrations are praiseworthy.

THE AMERICAN YEAR-BOOK OF ANESTHESIA AND ANALGESIA FOR 1915. Edited by F. H. McMechan, A.M., M.D. The Surgery Publishing Company, New York, 1916. Price $4.00.

The intention of this large volume of over four hundred pages, printed in double columns, is to present, to those who are interested in these subjects, the summarization of many, if not all, of the important papers which have appeared recently in regard to the effects of anesthetics and analgesics upon animals and man. It is freely illustrated, wherever the necessity for illustrations occurs, and handsomely printed upon heavy paper. It is the intention of the editor to publish subsequent volumes, or yearbooks, dealing with these subjects, thereby providing the profession with a large amount of information along these lines in concrete form. The papers, representing articles which have appeared elsewhere, deal with a number of very interesting subjects, as, for example, The Blood Changes Under Anesthesia and Analgesia; The Peripheral Origin of Shock; Posture in and Depth of Anesthesia; A Study of the Blood-Pressure Under Anesthesia from Records of Six Thousand Cases; Cardiac Fibrillation and Chloroform Syncope; Kidney Function and Anesthesia; The Nasal Administration of Nitrous Oxide-Oxygen; and a number of papers upon Local Anesthesia for General and Special Surgery. There is also an interesting paper upon Spinal Anesthesia in Genito-urinary Surgery; in addition to quite a number of others, as, for example, one upon Alkaloidal Amnesia in Obstetrics.

THE NATIONAL FORMULARY. Fourth Edition. Prepared by the Committee on National Formulary of the American Pharmaceutical Association. The American Pharmaceutical Association, 1916.

The National Formulary is designed to provide the physician and pharmacist with formulæ or prescriptions which have been proved to be therapeutically efficient, pharmaceutically elegant, and devoid of any chemical incompatibility. An energetic and thoroughly equipped committee of the American Pharmaceutical Association has prepared a book which in its previous editions has been much used by druggists and too little by physicians, who, as a rule, do not make themselves sufficiently familiar with pharmacy to enable them to write excellent prescriptions. The main part of the book, however, consists in describing drugs which have been in previous editions of the Pharmacopœia, or which are very commonly employed, although they have not been deemed worthy of inclusion in that legal compilation. The mere fact that they are not so included, however, does not prevent physicians from employing them and necessitates their preparation by the pharmacist when a prescription is written which calls for their dispensing.

The new National Formulary is an excellent companion volume to the new U. S. Pharmacopœia.

A MANUAL OF PRACTICAL LABORATORY DIAGNOSIS. By Lewis Webb Hill, M.D. W. M. Leonard, Boston, 1916.

This is a small handbook of less than two hundred pages in which the author has endeavored to bring together all the laboratory tests which he considers worth while and that the practical medical man needs, expressing them in such brief and compact

form that they can be readily carried out in the laboratory of the well-equipped physician. Various chapters deal with The Urine, The Blood, The Feces, The Gastric Contents, The Spinal Fluids, Pleural and Peritoneal Fluids, and Sputum. There are also a number of tests in Chapter 8 dealing with the stain for the gonococcus, the microorganism of syphilis, a description of the Schick test and Von Pirquet test, gram-positive and gram-negative organisms, and leucocytosis in various diseases. Every alternate page is a blank for notes by the operator, and, therefore, the text in reality only covers half the number of leaves which the book contains.

The idea of the author is an excellent one. Too many medical men are prevented from using the tests of clinical medicine by the feeling that they must employ a large and exhaustive manual which it is difficult to comprehend, if they are busy practitioners with little time left for laboratory investigation. This is unfortunate, since not infrequently diagnosis and treatment cannot be successful unless the physician calls to his aid laboratory methods, as well as those of ordinary observation and physical diagnosis. We therefore take much pleasure in calling attention to this excellent little contribution to medical literature.

PHYSICS AND CHEMISTRY FOR NURSES. By Amy Elizabeth Pope. Illustrated. G. P. Putnam's Sons, New York and London, 1916. Price $1.75.

The authoress of this book is already responsible for a number of other volumes intended for the use of nurses, including one upon Nursing in General, Anatomy and Physiology for Nurses, A Medical Dictionary for Nurses, and Essentials of Dietetics. Altogether there are 24 chapters in which nurses are given information along the line described on the title-page. Much of this information we believe is too technical for the needs of the average nurse, but the tendency at the present time seems to be to train the nurse to be rather a laboratory assistant than a bedside worker, which we believe is a mistake. This mistake exists also to some extent in medical education, but in the case of the nurse it is of infinitely greater importance that she should know how to take care of a patient, and that her training should be devoted to minute details in connection with such care than that many hours should be taken up through her course with matters which can only be of very little use to her when she is brought in actual contact with some one who is ill. In those training schools for nurses in which advanced courses of the kind which we have described are considered advisable this book will prove useful and popular.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Original Articles. Edited by H. R. M. Landis, M.D. Volume 2, 1916. J. B. Lippincott Company.

Under the able editorial management of Dr. Landis the present issue of International Clinics contains much that is of interest to the general practitioner, as well as the specialist. Opening with four articles of a therapeutic nature and with seven articles dealing with general medicine, it follows with two upon psychiatry, two upon obstetrics, three upon public health, and six upon surgical subjects. We note with interest that the editor, whose name has heretofore been associated with clinical medicine and therapeutics, is the leading contributor in the article entitled "Pre- and Post-Natal Work" under the heading of Obstetrics, all of which goes to show his versatility. The article by Dr. Beardsley upon Venesection, which opens the volume, is a good plea for this too little resorted to therapeutic measure.

A MANUAL OF OTOLOGY. By Charles Edwin Perkins, M.D. Lea & Febiger, Philadelphia, 1916. Price $3.00.

In the fourteen chapters which this little book contains the author describes the various diseases and changes in function which are connected with the auditory apparatus, and gives directions as to how they are to be treated, both by the general practitioner and the specialist. As the volume contains less than four hundred and fifty pages it is not as exhaustive as some of those which have appeared in medical literature within

recent years, but it is an efficient working manual for the active practitioner and the youthful otologist. The author, having been engaged in the teaching of otology and active otological practice for a number of years, is well qualified to sift out the essentials of his subject and to present them in an admirable way to the reader.

THE PRACTICAL MEDICINE SERIES. Edited by Charles L. Mix, A.M., M.D. Volume 3. The Eye, Ear, Nose and Throat, Edited by Casey A. Wood, M.D., Albert H. Andrews, M.D., and George E. Schambaugh, M.D. The Year Book Publishers, Chicago, 1916. Price $1.50.

The intent of the Practical Medicine Series, as our readers know, is to present a summarization of the literature from different fields of medicine for the year. This volume, therefore, contains brief abstracts of articles of importance which have appeared in various journals devoted to the subjects of which they treat. The present volume is very freely illustrated with plates, and the names of the editors indicate that the best of current medical literature receives attention.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., Assisted by L. F. Appleman, M.D. Volume Three, September, 1916. Lea & Febiger, Philadelphia, 1916.

The contributors to Volume Three of Progressive Medicine are: Edward P. Davis, M.D., Professor of Obstetrics in the Jefferson Medical College, who contributes a long and exhaustive summarization of Obstetrical Literature of the past twelve months; Dr. William Ewart, of London, who deals with Diseases of the Thorax and its Viscera in an article of about ninety pages; Dr. William S. Gottheil, of New York, who gives us an excellent summary of literature concerning Dermatology and Syphilis; and Dr. William G. Spiller, who, in about sixty pages, sums up the neurological literature of the year gone by. Each of these men is widely known as an authority; each of them has large clinical experience; and each is, therefore, qualified to pick up from literature the most important facts and to discuss and criticize them in such a way as to add interest and usefulness to the information which is given. Illustrations are to be found where they are necessary to illuminate the text.

THE CARE AND FEEDING OF INFANTS AND CHILDREN. A Text-book for Trained Nurses. By Walter Reeve Ramsey, M.D. Including Suggestions to Nurses by Margaret B. Lettice and Nann Gossman. Illustrated. J. B. Lippincott Co., Philadelphia, 1916. Price $2.00.

The very large number of small books which have been published during the last ten years for the use of nurses, in training and after training, makes one wonder that there should be such a demand for literature of this character. In some instances we have called attention to the fact that the volumes were too technical and too advanced for the ordinary trained nurse, and have expressed regret that the tendency seemed to be to teach nurses medical science rather than practical measures for the relief of those who are sick. That there is a field, however, for a book of this character cannot be doubted. Indeed, it may be said to be the first volume which is essentially a nurse's manual on the care of children. It is copiously illustrated with 122 pictures, and much valuable information is given to the nurse as to how she can help the mother take care of the child. A number of tables, in various places, give a great deal of condensed and useful information. Some of these are taken from other authors, and, possibly, one of the most useful is that quoted from Preyer giving the times at which the different bodily movements are developed in infants, points which the anxious and inexperienced mother is all too prone to ask about when she calls a trained nurse to her assistance.

THE MEDICAL CLINICS OF CHICAGO. Volume I, No. 6, May, and Volume II, No. 1, July, 1916.

The design of this publication, as we have pointed out on previous occasions, is to provide the practitioner with the information he might get were he so fortunate as to be able to devote a considerable amount of time to attending clinics given by various

medical men connected with hospitals in this western city. All of the clinicians are men who are actively engaged in hospital work, and we presume that in each instance they have had the opportunity to revise and correct the reports of their clinical lectures. A very wide field of clinical medicine is covered, including therapeutics, children's diseases, and certain states which are on the border-line of surgery, or, at least, in which the surgeon frequently has to come to the assistance of the physician.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

This month the abnormal atmospheric conditions have continued. Instead of fine, hot weather there have been downpours of great intensity, though luckily only lasting a few hours, mingled with periods of mild showers. Luckily the first fortnight was fine and warm, so that the crops had a good chance of ripening, and I am informed that up to the present no harm has come to the corn. The greater part of the corn has been cut, but not yet carted. The summer has been so abnormal that many people have not taken the trouble to put up their sun-blinds, and their absence has been noticeable.

There is again very little true medical news to report. Sickness amongst the troops is not prevalent, and most of the military hospital beds are occupied by those wounded in the course of the recent operations in Flanders. The general characteristics of the wounds are similar to those of the preceding periods, and there have been no radical alterations in the methods of treatment. In one of the recent numbers of the *Lancet* was a short but interesting article by Morrison of Newcastle, who has been using a mixture of iodoform and bismuth emulsified with paraffin for applying to perforated wounds, and reporting considerable success with this method. The method has also been tried at one of the London hospitals and good results are reported. One great advantage is that a wound so treated requires much less dressing than those treated by other methods, thus rendering the work of the hospital staff less onerous than where dressings have to be changed several times a day. It will be remembered that Sir Watson Cheyne made an effort to introduce a somewhat similar method during the autumn of 1914, which was adversely reported upon by the Royal Army Medical Corps, possibly owing to a trial which was not sufficiently extensive and not carried out intelligently. It will be interesting to see if this new method will be given a further trial, and how it will succeed when in hands other than those of the originator. I understand from many of those who return from the front that at the end of the war there is likely to be considerable criticism of the methods which have been employed for the treatment of these wounds.

Now that the nights are beginning to lengthen, more Zeppelin raids are expected. In spite of the danger attached to the dropping of bombs, these raids are still regarded more in the light of spectacular incidents than as real elements of danger, and few cases are met with attributing their illnesses to the bombs. I have met with two cases of chorea, the origin of which was stated by the parents to be fright on the night of one of the raids, but nothing in the behavior of the patients suggested that the disease was anything out of the ordinary. A number of elderly patients also state that their ailments originated in fright resulting from a raid. Their relatives state that they have never quite been the same since that time, and that a general failing of mentality has ensued. I met with one case of a well-known legal gentleman whose domicile was within a few yards of the spot where a bomb

fell. All the windows of his house were smashed, at a time when he was preparing to go to bed. He was considerably frightened and very nervous for a week or more, but then apparently recovered. He had, however, steadily gone downhill from that time, with loss of weight and inability to concentrate, eventually dying from some very indefinite cerebral condition, with which none of the ordinary causes could be associated. He died about eleven months after the night of the raid. For about a week prior to his death he had been delirious at night, and in his delirium constantly referred to bombs, broken glass, and so forth. He had declared that he had ceased to think about the raid, but there is probably some connection in this case. Bombing is becoming a more or less common term, in so much as a few days ago I heard a child of six or seven telling a gate which would not open that he would drop a bomb on it.

In connecton with airship raids a new lighting regulation has been promulgated, and will come into force on September 1. Under this regulation both street lighting and the lighting of private houses will be more restricted than up to the present. The restrictions seem to be chiefly directed against shop lighting. In some of the districts of London where a good deal of shopping is done at night, powerful lights are employed, throwing their beams on to the shop and on to the pavement in front. No lights are to be employed which throw a light on to the pavement. No lights in private houses will be allowed of such a strength that they illuminate the houses opposite. Stringent lighting regulations seem to be the best defense against Zeppelin raids, and I am informed that Norwich owes its immunity from attacks to the strictness of lighting regulations. The latter are so strict that it is not allowable to light a cigarette in the street after nightfall. In spite of the German communiqués, Norwich has never been touched by bombs, though apparently frequent attempts have been made to injure this country town.

I have in previous letters described the free meals which have been provided by the school authorities for children. Such is the prosperity of this class at the present time that it is not now necessary to provide meals on Saturdays and Sundays, and the numbers provided on other days have been reduced by half as compared with those required in previous times. In connection with the children, it is further interesting to notice that this year there has been less infantile diarrhea than is usually the case at this season. No doubt this is largely due to the absence of long spells of dry and hot weather, but to a certain extent it must be attributed to the fact that fewer mothers are going out to earn wages, and possibly to the establishment of a large number of crèches, in which the mother, should she be obliged to go out, can leave her child. More clinics for children are also being established, and are under the supervision of the local authorities. These clinics do not lay themselves out to treat the affected children, but to give advice to the mothers, which advice is largely of a prophylactic character. Thus in the case of diarrhea the mother would be instructed as to sterilizing and preserving the sterilized milk, and only the simplest treatment would be given. She would further be warned that if the condition did not improve the child should be taken to one of the children's hospitals, where special treatment is carried out for this condition. Some of the children's hospitals open special departments during the summer to cope with these cases, but do not open until a certain fixed number attend the casualty department on any given day. This year the number has been so small that few of these departments have been required.

About a year ago a number of cases of anthrax, the primary lesion being on the face, were notified. After some little investigation the cause was traced to cheap shaving brushes, the hairs of which were found to be infected. In the last few weeks several more cases have been reported, and consignments of cheap shaving brushes made with pig's bristles were confiscated.

We are, however, not told from whence these consignments were derived.

Owing to the war the annual inter-hospital athletic competitions have naturally been abandoned, so that I have no results of such competitions to record.

I cannot close this letter without referring to the deep sympathy which is felt on this side for those cities affected by the epidemic of infantile paralysis. Some little anxiety has been expressed lest the epidemic should spread to this country. This does not appear likely, and we hope that the opportunity will be seized to trace the mode of infection of this disease.

WANDERING TAPEWORM.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: I am enclosing the history of a case of wandering tapeworm (*Tænia saginata*) which because of the peculiar findings and the few cases reported I feel is worthy of printer's ink.

L. M. B., female, single, aged thirty-two, always enjoyed good health. The five years previous to December, 1914, she spent in Winnipeg, Man., as telephone operator and domestic. Since that time until she had to give up work she was engaged as chambermaid in one of the hotels of this city. Two weeks before leaving the hotel she began to have pain on the crest of the right ilium, and this became so severe that a physician was summoned, who administered hypodermics of morphine to relieve the pain. This was necessary on several occasions; in all six or seven injections were made into the gluteal muscles. This relieved the pain but temporarily. At first the condition was thought to be rheumatic in nature, and later a tubercular infection was suspected. The patient denied having injured the affected part in any way. On March 25, 1915, eight weeks after the onset of the pain, she came to my office for treatment.

The patient was well nourished, walked with gait favoring the right hip, but did not complain of pain on suddenly and forcibly jarring over the trochanters on the affected side, or on the manipulation of the femur, but pressure over the middle and posterior two-thirds of the crest of the ilium caused pain; further examination revealed a discolored, prominent, fluctuating area several inches in diameter over the sacroiliac joint in its superior portion. An abscess was diagnosed, and with a large aspirating needle a drop of thick pus was obtained. The patient, not being able to bear the expense of hospital care, returned to my office the next morning, and under chloroform anesthesia I opened the abscess and evacuated about four ounces of thick pus with a characteristic colon bacillus odor. The abscess cavity was not explored at this time, but next day I found it to extend forward along the posterior two-thirds of the crest of the ilium and occupying the entire space between the posterior and middle gluteal lines. At the time of operation I did not think there was anything unusual except the odor of the pus, a specimen of which I now regret that I did not save for laboratory diagnosis.

One week later one can imagine my surprise, while dressing the wound, to express out a segment of tapeworm, and during the following eight days fifteen more segments passed from the wound, some living, others dead on the dressings. During this period I injected into the cavity of the abscess 10-per-cent argyrol, 5-per-cent protargol, tr. iodine and tr. benzoin, on successive days. On March 26 the abscess was opened and drained; on April 2 the first segment was expressed from the wound; and on the 8th, without any internal medication, the patient passed 17 feet of tapeworm from the bowel.

The unusual features of the case were the sudden onset with pain in the crest of the hip-bone, the patient never having experienced any abdominal or intestinal symptoms at any time previous or since; the character of the odor of the pus at the time of evacuation without the presence of fecal discharge; the number of individual segments which were extruded from the wound, which was situated over the sacroiliac notch, so that the distance from the anus would rule out wound contamination.

The question is, then, how did the parasite become lodged in this position? I have found but one reference which stated that the tapeworm had been found in other organs outside of the bowel, being forced into them probably in the act of coughing or vomiting or like manner. Cases have been reported where extrusion has taken place through inguinal and umbilical fistulæ and from the bladder due to the presence of a rectovesical fistula, and also into vagina by rectovaginal fistula. In this case there was absence of abdominal symptoms, or of a sinus communicating with the bowel, but a colon-bacillus odor from the pus evacuated. I am inclined to believe that there must have been some communication with the bowel which had healed, but which I failed to find.

The patient was last seen in the office April 27 with the wound entirely healed.

ALFRED DEAN, M.D.

GRAND FORKS, N. DAK.

CANNABIS INDICA.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: The interesting article by Dr. Charles W. Burr in your issue of August 15 leads me to give a summary of my experience. I have used cannabis indica considerably, in fact almost as a routine, to diminish pain and check secretion in hyperchlorhydria. For the former purpose it has seemed quite efficient; as to the latter, it has not been possible to discriminate between the direct action of this drug and dietetic and neutralizing measures employed conjointly. For several years, up to about fifteen years ago, cannabis indica as found on the market was very unreliable, and the dosage of any particular preparation had to be determined experimentally. About this time, at the suggestion of Dr. W. H. Woodbury, I began using an imported English extract, for convenience making a one-per-cent alcoholic solution. For about ten years I have used P., D. & Co.'s and a few other American galenicals, and have found them satisfactory.

Especially for a short period after changing from unreliable to active preparations, and occasionally since, on account of variability in susceptibility, voluntary increase or repetition of dose by patients, etc., I have seen quite a good many cases of intoxication, probably twenty at least. With one exception seen quite recently, I have never observed nor obtained by leading questions a history of disturbance of time and space relations so graphically described by H. C. Wood. Nor have convulsions, loss of consciousness, or serious disturbance of intelligence, stupor beyond moderate drowziness, or notable disturbances of any visceral function been observed. With the exception noted, the sole symptom of intoxication has been anxiety and subjective feeling of danger from the drug, often amounting to apprehension of a fatal result and sometimes to an acute fear of death. Anxiety, though not amounting to fear of death, was a marked symptom also in the single case with disturbance of time and space relations. The patient, a prominent member of an allied profession, while walking home, a mile or so, felt that the distance of each block was interminable. So far as I could get at the exact mental state, there was no fear of physical inability to get home, but merely the growing weariness, more psychic than physical, and the beginning of an obsession that one must arrive at the destination that most of us experience on any kind of a journey on foot, bicycle, in an auto, or even on a train, when it becomes extremely long drawn out. Many of the cases were, of course, seen during the period at which anxiety was most marked In none was there any objective evidence of cardiac, respiratory, or other failure of vital function, nor could the patient explain subjectively why anxiety was felt or locate the reason for anxiety. The cases, indeed, reminded me of a type of seasickness which I have personally experienced, in which there is intense subjective discomfort, but without pain or any other local symptom—not even excepting vomiting—to explain the psychic condition. However, in seasickness there is really a state of shock, probably due pretty directly to mechanic traction

on the pneumogastric, by reason of the inertia of the liver, movable kidneys, etc.

Very truly yours,

A. L. BENEDICT, M.D.

BUFFALO, N. Y.

THE CORRECT ANALYSIS OF HORLICK'S MALTED MILK.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: We note that you quoted in the Progress columns of the July issue of your journal an article by Dr. F. W. Howe on "The Chemistry of Cow's Milk and Other Products Used in Infant Feeding," which appeared in the January issue of the *Archives of Pediatrics*, and we desire to call your attention to the fact that the article by Dr. Howe, as it was originally published and quoted, gave an incorrect analysis of Horlick's the Original Malted Milk, inadvertently taken from the early edition of Dr. Holt's book.

In the March issue of the *Archives of Pediatrics* Dr. Howe, on discovering the error, published a corrected analysis of Horlick's Malted Milk, which is as follows:

	Nestle's Food.	Mellin's Food.	Eskay's Food.	Malted Milk (Horlick's).	Ridge's Food.	Imperial Granum.	Lacto Preparata.	Carnrick's Food.
Fats	% 4.45	% 0.24	% 1.16	% 8.78	% 1.11	% 1.04	% 12.35	% 7.45
Proteids	11.47	11.50	5.82	16.35	11.81	14.00	14.51	10.25
Cane sugar	29.22							
Dextrine	6.22	19.20	14.35	18.90	1.28	1.38		
Dextrose, Lactose (milk sugar)	15.95		53.46	49.15	0.52	0.42	63.68	
Maltose		60.80						
Total soluble carbohydrates	51.39	80.00	67.81	67.95	1.80	1.80	63.63	27.08
Insoluble carbohydrates (starch)	28.43		21.21		76.21	73.54		37.37
Inorganic salts	1.73	3.59	1.30	3.96	0.49	0.39	3.68	4.42
Moisture	2.53	4.78	2.70	3.06	8.88	9.28	5.80	9.42

From this it will be noted that our product contains no starch, and that the fat content is 8.78, and not as erroneously printed. We bring this matter to your attention, as we feel you will want to give your readers the benefit of this corrected statement, in the next issue of your journal.

Very truly yours,

HORLICK'S MALTED MILK COMPANY.

NOTES AND QUERIES.

SHIPMENT OF POISONOUS DRUGS BY MAIL.

The *Boston Medical and Surgical Journal* of September 14, 1916, calls attention to the fact that there has recently been introduced in the United States Congress, at the instance of the National Association of Manufacturers of Medicinal Products, a bill to amend Section 217 of the United States Criminal Code relating to the shipping of poisonous substances by mail. This bill (Senate 6834, House 17396) is known as the Kern-Doremus Bill, from the names of its proponents in the two houses. The present section of the Criminal Code above referred to forbids absolutely the transmission of poisonous drugs, even for legitimate purposes, by mail. This prohibition may prevent the mailing of emergency preparations ordered by physicians from a distance by telephone or telegraph. It has seemed to the advocates of the Kern-Doremus Bill that this article should be amended so as to exclude only drugs not outwardly or of their own force dangerous to life, health, and property, and to permit the shipping by mail of poisonous drugs not thus dangerous if securely and properly prepared and packed, so as not to endanger the mails or those handling them from leaking or breakage. In accordance with this feeling the new bill has been drawn in part as follows:

"Sec. 217. All kinds of poisons and all articles and compositions containing poisons which are outwardly or of their own force, dangerous or injurious to life, health or property; and all other poisons, and articles and compositions containing poisons so in-

securely packaged as to endanger the mails or those handling them from leakage or breakage; all articles and compositions herein described that are not packaged and prepared for the mails in accordance with any regulations that may be made by the Postmaster-General for their preparation and packing; and all poisonous animals, insects, and reptiles, and explosives of all kinds, and inflammable materials, and infernal machines, and mechanical, chemical, or other devices or compositions which may ignite or explode, and all disease germs or scabs, and all other natural or artificial articles, compositions, or materials of whatever kind which may kill, or in any wise hurt, harm or injure another, or damage, deface, or otherwise injure the mails or other property, whether sealed as first-class matter or not; and all spirituous, vinous, malted, fermented, or other intoxicating liquors of any kind are hereby declared to be non-mailable matter and shall not be conveyed in the mails or delivered from any post-office or station thereof, nor by any letter carrier."

The remainder of the bill provides penalties for violation of these provisions. The Postmaster-General is empowered to make suitable regulations respecting preparation and packing for the mails.

The intent of this proposed amendment seems just, and the bill in question has been indorsed by the American Pharmaceutical Association and the American Association of Pharmaceutical Chemists. Its discussion and further consideration will presumably be postponed until the next session of Congress.

THE WEASEL IN MEDICINE.

The *Boston Medical and Surgical Journal* of September 21, 1916, tells us that Mr. Philip Hale has recently called attention to the description given in Edward Topsel's "History of Four-footed Beasts and Serpents" (London, 1658) of the medicinal uses that were made of the weasel in the spacious Elizabethan days and thereafter, as late as the restoration. The following is the remedy recommended for gout:

"'Take a little young whelp alive, well fatted, and a living weasel in nine pints of Oyl, and unto the same two or three pounds of butter and boyl them together until the beasts be made lank or lither, and then put your hands or feet a whole day in hot Oyl well strained.' It would be easier, continues Mr. Hale, to put weasel powder in wine; this would also be efficacious in epilepsy, the headache, and in case you were bitten by a scorpion; also for palsy or shaking of the joints; 'very effectual for the expelling or taking away of the pin and web in the eyes'; it helps all sores and impostumes. Some recommend the brain of a camel mingled with those of the weasel. If an ox or horse is stung, stroke the wounded place with a weasel skin. If you are bitten by a weasel, apply onions and garlic externally or in sweet wine.

"Two remedies should here be given in full. The powder of a weasel being mingled with the blood of a young swallow doth heal the quinsie or squinzie. 'The same is also very effectual for the expelling of wens or bunches in the body. The same diseases are both healed by this medicine, to burn a living weasel altogether in an earthen pot, and to mingle with the powder thereof Honey, Turpentine and Butter of each a sufficient quantity, and in the manner of an Oyntment to apply it unto the bodies of the grieved parties.'

"'There is a speedy remedy for the driving away of rheum in the head, and the Catarrh swelling by rheum in the jawes, which is this: To take a Weasel upon a Thursday in the old Moon, and put him alive in an unburned pot, that in the Boyling he may be torn, and dryed into powder, which powder being gathered together and well tempered with Honey, to give it to the diseased person every day in a spoon fasting, to the quantity of three drams, and it will in short space wonderfully ease him.'

"These remedies, Mr. Hale pertinently observes, were prescribed by the wisest ancients. They were soberly advised in 1658. What will men and women of 2158 say to the treatment and prescriptions of 1916?"

THE THERAPEUTIC GAZETTE

INCORPORATING

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ORIGINAL COMMUNICATIONS.

INFILTRATION ANESTHESIA.

BY CHARLES F. NASSAU, M.D., LL.D., F.A.C.S.,

Assistant Professor of Surgery in the Jefferson Medical College, Philadelphia.

While general anesthesia will never be displaced, yet if an operation can be done without the discomfort and danger of general narcosis, why not, as frequently as possible, use some form of local anesthesia? This is a practical question.

There are many patients to whom it is unwise to administer general anesthesia. There is another class of patient where the question as to whether general or local anesthesia shall be used often means the question of life or death. For instance, when confronted by a patient desperately ill with a strangulated hernia, the patient will have many more chances for recovery if the surgeon is thoroughly familiar with some form of local anesthesia, whether it be nerve blocking, infiltration, or a combination of both, than he would have in the hands of a man who, through lack of knowledge, was compelled to use general anesthesia. It should be the practice of every surgeon to operate as often as he can under local anesthesia, even upon those cases that could perfectly well take a general anesthetic. This is the only way that the method can be learned so that it may be used successfully on demand.

The field of operative possibility under local anesthesia has broadened to such an extent that it is difficult to definitely limit its scope in the hands of one skilled in its use. The surgeon operating by this method must school himself to the use of an essentially different technique from that commonly employed in operations under a general anesthetic. He must be possessed of a calm temperament, skilled in clean operative dissections, and accustomed not to handle tissues unnecessarily. Above all things, he must have learned gentleness, willingness to spend plenty of time, and to have acquainted himself accurately with the sensibilities of the various tissues encountered in the different operative fields.

For the occasional operator to attempt major operations under local anesthesia is to court failure.

Infiltration anesthesia is a term used to indicate that form of local anesthesia which is secured by distending the tissues of a part of the body with a fluid, anesthetic in character, such as cocaine, or indifferent in nature, such as an isotonic solution of sodium chloride. We may use the phrase "terminal anesthesia" because the anesthetizing agent acts upon terminal branches of sensory nerves; "regional anesthesia" because the fluid injected affects some particular point of a sensory nerve in its course from the organ; still, the actual process is one of infiltration. If we inject the anesthetic around the nerve, the term "perineural injection" may be employed; when the fluid used to produce analgesia is introduced directly into the nerve, we speak of "endoneural injection;" nevertheless, the procedure is one of infiltration.

In making up a solution for injection, always use the smallest percentage of chemical agent necessary to render the part anesthetic. I have used various formulas during the past twenty years. At the present time, I find that either the solution recommended by Mitchell, or one-quarter-of-one-per-cent solution of novocaine in salt

solution, gives entire satisfaction. Mitchell uses a tablet containing three-fourths grain cocaine and one-four-hundredth grain adrenalin. These have been made for many years by one of our large drug houses. Two tablets should be taken from the hypodermic tube, wrapped in cotton, and put in a small vial closed with a cotton stopper. The tablets are then sterilized by dry heat in a temperature slowly rising to just short of 100° C. I make my solutions at the time of operation by dropping one tablet into 50 Cc. of salt solution, and the second tablet into a cup containing 100 Cc. of salt solution. The stronger solution is used for infiltrating the skin, blocking nerves, or for any particularly sensitive areas. The weaker solution is used for general infiltration of tissue. The one-quarter-of-one-per-cent novocaine solution should be boiled in small cotton-stoppered glass flasks, and the one strength may be employed throughout any operation. I have never seen the slightest deleterious physiological action with these extremely weak solutions of cocaine. The total dosage, however, should not exceed one and one-half grains.

The surgeon should provide himself with three Record syringes—two of 5-Cc. capacity each and one of 10-Cc. capacity, the latter as a rule being used only in fat subjects or in large operative fields, such as in shoulder-joint amputation, or amputation of a leg, or in breast work. Two fairly fine needles one and one-half inches long, two slightly coarser needles two inches long, and two about four inches long, will be necessary. A knife with an extremely keen edge, a pair of very sharp Mayo 5½-inch straight dissecting scissors, tooth-dissecting forceps, and fine-pointed artery clamps, will facilitate this kind of work.

As a concrete example, let us take an appendectomy in a patient with a frank tuberculosis of the lung, for whom general anesthesia would be extremely injurious:

The patient should always be informed that the success of the procedure will depend to a great extent upon his intelligent coöperation. In the majority of cases I administer one-quarter grain morphine hypodermically one-half hour before operation. With this may be given a dose of scopolamine varying from 1/100 to 1/50 grain, according to the age and size of the patient; usually, however, I do not give it. It should be the duty of some intelligent person to stay by the patient's head and distract his attention by trifling conversation, sponging his face, administering small sips of water if thirst is annoying—in other words, to distract the attention of the patient from the operation. One might call such a person the psychic anesthetist. Preoperative preparations and instruments should be carefully excluded from the range of the patient's vision. Needless conversation between surgeon, assistants, and nurses should be avoided.

The patient, having been prepared for operation, is placed upon the operating table and made as comfortable as possible. The head is arranged upon a pillow, the arms disposed comfortably at the sides, and a folded blanket is placed under the lumbar spine. The patient's wishes may be consulted as to whether he desires a piece of gauze placed over his eyes. Usually the patient, unless addressed, keeps his eyes closed. The psychic anesthetist engages the patient in conversation, the surgeon is cheerful, full of confidence, and endeavors to communicate his frame of mind to his subject.

Begin infiltration by taking a 5-Cc. syringe filled with the stronger cocaine and adrenalin solution; use a fine needle. Pinch up a small piece of skin, informing the patient that you are going to stick him with a needle. Holding the needle almost parallel with the skin, barely insert the point under the epidermis and at the same time press on the piston of the syringe so as to obtain an infiltrated spot simultaneously with the introduction of the needle. The pain caused by the introduction of the first needle is trivial and does not accompany subsequent insertions. A small wheal is now produced in which the integument assumes a blanched pig-skin appearance. From the center of this infiltrated circle the needle can now be painlessly inserted to its

full length in the skin (not under the skin) parallel with the surface. Do not insert the needle too deeply at this time. As the point of the needle travels, the solution should be fed from the syringe. Ordinarily, 2 Cc. of solution will infiltrate 1½ to 2 inches of skin. After the superficial infiltration, a coarser and longer needle should be used to infiltrate subcutaneous tissues.

The easiest method of approach to the appendix under infiltration anesthesia is McBurney's muscle-splitting incision. The incision can now be made down to the aponeurosis of the external oblique. Then infiltrate the muscular and aponeurotic portion of the external oblique. Make a split in the aponeurosis with knife and finish with Mayo scissors; gentle clips with the scissors cause less pain than knife dissection. Retract the aponeurotic layer carefully. Now infiltrate the internal oblique and split it. The transversalis and peritoneum are infiltrated with the stronger solution, which I employ at this point for the first time since the infiltration of the skin. Incisions in all layers of the abdominal wall must be of ample size to avoid unduly strong retraction. Up to this stage the patient should experience no pain unless a vein has been clamped without previous infiltration with the stronger solution. The visceral peritoneum may be cut, clamped, burned, and stitched with impunity, but undue traction upon the mesentery immediately causes general cramp-like abdominal pain with consequent rigidity of the abdominal wall. The appendix is sought for by gently following the anterior longitudinal band intra-abdominally, rather than by attempting to pull the cecum out of the abdominal incision. If the appendix is very adherent or carried up under the cecum, it may be necessary, in unusual cases, to give the patient a few inhalations of nitrous oxide during the freeing of the appendix. The gas anesthesia need not be continued after the base of the appendix is reached for crushing and tying. Traction on the mesoappendix must be gentle, and before tying it infiltrate with the stronger solution. The crushing, ligation, and inversion of the appendix is not accompanied by pain. Occasionally the necessary traction on the mesocolon will cause the patient to have nausea, which is relieved as soon as the traction ceases. Suture of the abdominal wall now follows without special incident, except that very small gutta-percha drains should be inserted just under the skin at one or both ends of the incision, when infiltration anesthesia has been used. These drains take care of any possible oozing that may occur after the effect of the adrenalin has worn off.

Wounds in patients operated upon under infiltration anesthesia heal just as kindly as any other wounds. The postoperative course is infinitely more comfortable. Unless much traction has been made on the abdominal viscera, vomiting rarely occurs. Postoperative thirst may be avoided by giving reasonable quantities of water at once. The severe backache complained of by patients who have taken a general anesthetic is absent. Peristalsis is rapidly established, and with a minimum of gas pains. The wound itself is never as painful; particularly, abdominal wounds are not insulted by coughing and vomiting. I have found, however, that in young children and neurotic individuals infiltration anesthesia is frequently an impossibility.

I have done all of the following operations under local anesthesia: Tracheotomy, tuberculous glands of neck, rib-resection, goitre, ligation of superior thyroid arteries, gastrostomy, iliac colostomy, typhoid perforation, abscess of lung, chronic and acute appendicitis, appendiceal abscess, jejunostomy; radical cure of inguinal, femoral, umbilical, strangulated, and incisional hernias; resection of the bowel, suprapubic cystotomy, ligation of femoral artery, cholecystostomy, suture of fractured patella, amputation of arm, amputation of thigh, amputation of leg, removal of stone from pelvis of kidney, posterior and anterior gastroenterostomies, hysteropexy, kidney abscess, psoas abscess, and have used it in large numbers of minor procedures.

1831 CHESTNUT STREET.

BROMIDE SEDATION IN EPILEPSY.

BY WILLIAM T. SHANAHAN,
Superintendent Craig Colony for Epileptics, Sonyea, New York.

In a review of the literature in regard to the treatment of epilepsy, it is apparent that sedatives of various kinds were in use antedating the prescribing of bromide of potassium some sixty-five years ago. For a considerable time after the use of bromides was initiated the exact method of its operation in controlling seizures was not well understood. Subsequently experiments, carefully made, demonstrated that a sedative action on the cortical cells was effected by bromides given in sufficient dosage to insure physiological action. While perhaps a bromide repeated in reasonable doses, given under careful restrictions, may in the ordinary person cause no deleterious result, it has been too commonly the experience of physicians that bromides administered over a considerable period of time have in some patients caused permanent damage, or so reduced the general health of the individual under treatment that one might well feel convinced that the remedy was worse than the disorder.

It is a matter of record, however, that bromine, or some of its salts, when properly given, with due attention to combating the evil effects of the drug, bring about material improvement in carefully selected epileptics, and in some an apparent arrest of the symptoms of the disorder. The statement "carefully selected epileptics" is one which should be borne in mind, as it is not only useless but harmful to administer bromides indiscriminately to an epileptic patient solely because he or she presents many, or apparently all, of the phenomena belonging to the disorder, and in consequence the physician prescribes a sedative which should be used with careful discrimination.

Another phase of the use of bromides is that the epileptic outside of the special institution is oftentimes not under the close surveillance as to mode of living as is the institutional epileptic. Such lack of the following out of carefully regulated hygienic and dietetic rules of life requires in lieu thereof perhaps a more extended use of sedatives, *e.g.*, bromides in some form or other, where such sedation would not be required in the institutional epileptic. It is very commonly observed that the removal or alleviation of abnormal conditions existing in epileptics may so improve the general health of the particular patient that the symptoms of his epilepsy are relieved at least in part without the administration of depressants to the cortical substance. Unless the bromide is given in the form of sabromin, sedobrol, or some other of the more elegant preparations, great care must be exercised to give the bromide salt in solution following meals and well diluted. While the ordinary epileptic is prone to suffer from constipation, the one under bromide medication has a special tendency toward this symptom, therefore laxatives, colonic flushings, etc., must be freely resorted to. In order to maintain a proper functioning of the skin in the epileptic under bromide medication more frequent bathing than is ordinarily the case is essential. Proper care of the mouth, teeth, etc., is also of the utmost importance.

As the result of experience in various parts of the world in the treatment of epilepsy in its great variety of phases, it has been found that for selected patients without marked mental defectiveness or deterioration, suitable change of environment, the directing of the energies of the particular epileptic along new channels, prevending too much self-centering of interests, readjustment of any disturbing factors which might tend to cause undue psychic upset or unrest, the proper fitting of glasses, correction of dental caries when present, placing the individual at a congenial occupation with sufficient recreation during hours of leisure, allowing a reasonably restricted diet, and a common-sense following out of the rules of hygiene, have so harmonized the life processes that there occurs marked improvement in many epileptics in whom no sedation of any sort has been

resorted to. Sedatives such as bromides too often only mask the symptoms in epilepsy, tending to arouse false hopes as to complete recovery, thus often leaving out of action the basic readjustment of living conditions necessary to demand of an epileptic whose active coöperation in carrying out lines of treatment is absolutely essential for improvement.

At the Craig Colony for Epileptics during several years past there has been a marked reduction in the quantity of bromides used in the treatment of its patients, as is shown in the accompanying table. Among the bromine preparations used were the various bromide salts, potassium, sodium, and ammonium; bromopin; brometone; sabromin; sedobrol, etc. The patients under treatment were epileptics of all ages from infancy to the advanced senile period, the majority being young adults. The duration of epilepsy in those under treatment varied from a few months to a great number of years, the majority being several years. Both sexes were under treatment, a slightly greater number of males than females. It will be observed that while the average dosage of bromide used was materially lessened, the average number of seizures did not increase, as might be expected. A very considerable percentage of the patients had a well-defined organic epilepsy, the others what we still term in our lack of knowledge as "idiopathic." Chloral hydrate, amylene hydrate, hyoscine hydrobromide, and other sedatives have been made use of at the Colony, but for only acute phenomena—*e.g.*, status epilepticus, or serial seizures—and not administered regularly over a considerable period as is done with bromides. It is of interest to note that with the lessened administration of various preparations of bromine there has been no increase in the average number of seizures per patient, but on the other hand there has on the whole, if anything, been a slight lessening in the number, the conclusion being that the general readjustment of every possible phase of the epileptic's life is of more importance than the indiscriminate use of sedation.

Population of Colony by years.	Dosage. Ounces bromides and other bromide-containing compounds per patient yearly.	Average number of seizures per patient.
1902 – 762	10.8 ounces.	98
1903— 824	12.5 "	124
1904— 836	15.6 "	124
1905 – 992	10.8 "	146
1906—1046	12.2 "	136
1907—1054	5.7 "	128
1908—1160	8.8 "	127
1909—1273	8. "	118
1910—1330	.28 ounce.	110
1911—1381	1.7 ounces.	106
1912—1433	.1 ounce.	115
1913—1434	.4 "	104
1914—1428	.87 "	105
1915—1450	.45 "	95

OBSERVATIONS ON THE MEDICAL ASPECT OF CHOLECYSTITIS AND CHOLANGITIS.[1]

BY R. ALEXANDER BATE, M.D., LOUISVILLE, KENTUCKY.

The medical aspect of cholecystitis and cholangitis has, to me, always seemed clear. However, the spirit of the times has favored mechanical or empirical rather than rational or scientific therapeutics. A more adequate conception of the clinical situation may be obtained by temporarily forgetting the term "gall-stones;" instead let us consider the physicochemical processes resulting in the precipitation of biliary concretions.

It is well known that the interior structures of the larger bile channels, the gall-bladder, and the duodenum are identical; that these avenues are lined with continuous mucosa composed of columnar epithelial cells containing mucous glands; that the material secreted and excreted by these glands is also practically identical in composition. In the duodenum this is secretin or entero-kinase, which activates intestinal secretions. While the physiological action of the mucin contained in the biliary secretion has never been defi-

[1]Delivered before the Louisville Medical Club, Louisville, Kentucky, March 17, 1916.

nitely demonstrated, it seems reasonable to presume it has a controlling or regulating effect upon the functions of the biliary structures similar to that of "secretin" upon the intestinal tract. Mucin has been called albuminous material, or nucleo-albumin, by various writers.

Normal bile is composed of pigments, principally bilirubin and biliverdin, the so-called bile salts and fats, cholesterin, lecithin, and a minute quantity of calcium. Precipitation of cholesterin results from qualitative changes in the bile, due to irregular metamorphosis by disturbed metabolism and bacteria. Biliary concretions are never formed so long as the bile remains normal; it is only when the composition of the bile varies from the normal standard that the formation of such concretions occurs.

Cholesterin, which is the chief constituent of all biliary concretions, normally exists in the bile ducts in the amount of about one-sixteenth of one per cent; whereas in the gall-bladder one per cent may be present in normal bile. In pregnant women four times as much cholesterin is present as in the non-pregnant and in males. Thus there is a tremendously increased liability to the formation of biliary concretions in the pregnant, and this proportion holds good clinically; more than four multiparous women having gall-stones to one who is barren.

On account of its various constituents the bile possesses a distinct antiseptic quality. The minute quantity of calcium present may be of vital importance to biliary function—*i.e.*, it may be the controlling element by which secretion is established and maintained, and it may also be the chief factor in the formation of concretions. However, there are probably several causes for the increased cholesterin precipitation.

Cholangitis and cholecystitis may be the result of extension of infection from the duodenum from continuity of structure, or by localization of bacteria circulating in the vascular and lymph channels. Whenever biliary stasis occurs—*i.e.*, when the emptying of the gall-bladder is delayed or prevented by obstruction of the common duct—then the mucin present in the bile undergoes decomposition and its antiseptic action is suspended. When this occurs the bile naturally undergoes certain changes, the lecithin no longer holds the cholesterin in solution, the antiseptic effect of the bile is destroyed, and if bacteria be present infection supervenes. The antiseptic action of normal bile is sufficient to destroy invading bacteria under ordinary circumstances. It has been experimentally shown that virulent bacteria injected into the healthy gall-bladder will not produce concretions in the presence of normal bile. If the mucosa be already damaged, or the composition of the bile changed, infection occurs and the formation of concretions results. On the other hand, it is claimed by certain observers that during their experimentation bacteria isolated from the gall-bladder mucosa injected into the blood stream, regardless of location, produced infection of the hepatocystic tract in forty per cent of instances. I do not believe this means there is a specific gall-bladder microörganism, but probably the gall-bladder is the most suitable habitat for the microörganism which produces both physical and chemical changes. Possibly the irritation produced by infection of the gall-bladder mucosa causes an increased excretion of various fluids, particularly the nucleo-albumins and calcium molecules, thus favoring the precipitation of cholesterin.

Osler states that two hundred and forty of Deaver's cases of gall-stones were examined for microörganisms, and fifty-two per cent showed sterile cultures; thus in the majority of his cases infection was evidently not a factor in the production of biliary concretions. In sixty-eight cases colon bacilli were present; in others staphylococci, streptococci, and other bacteria were found. The fact that in the majority of instances no bacteria were present certainly minimizes the rôle of infection in the etiology of gall-stones. Microörganisms may be a factor in the production of biliary concretions, not because they are microörganisms, since

virulent bacteria may be injected into the healthy gall-bladder without producing concretions, but because they may induce changes in the mucosa or the biliary secretion favoring the precipitation of cholesterin and other solid constituents—acidity or alkalinity.

Biliary concretions are ninety per cent cholesterin, which chemically is simply a triatomic alcohol. Bilirubin-calcium and some other solids have been found in gall-stones. Bilirubin-calcium in gall-stones occurs in the proportion of from thirty to ten per cent. Biliary concretions may vary in size from millet seeds to an enormous mass completely filling the cavity of the gall-bladder. When it is considered that ninety per cent of this mass consists of triatomic alcohol, which may be easily dissolved by the employment of certain chemical agents, it does not seem unreasonable to presume that such concretions are usually disintegrated within the human body.

In the medical treatment of cholecystitis and cholangitis complicated by gall-stones, the bismuth preparations seem decidedly harmful instead of beneficial. There are several drugs which are supposed to enter into combination with the biliary constituents, and the specific action of these various medicaments may be thus secured. Of these drugs perhaps the valerianate of amyl offers the most promising results. It not only acts as a sedative and quiets the muscular spasm, but also has a solvent effect upon cholesterin; for these reasons it should be used in all cases instead of morphine, which has been most highly recommended. Of the various fatty substances or oils which have been advocated, glycerin is now coming into prominence. As lecithin is a normal constituent of bile and also a solvent of cholesterin, any medicament containing lecithin is indicated. The explanation of the tremendous popularity of olive oil in the treatment of gall-stones is because of the large percentage of lecithin it contains.

It must be remembered that cholesterin is not a product of the hepatic secretion, that it simply represents disintegrated tissue from various structures and is excreted by the liver. Lecithin is the material which holds in solution various solid biliary constituents, besides its detoxicating and lipoid effects, therefore the administration of lecithin-containing medicaments is certainly the most rational therapy.

It has been said that anything which will increase the circulation of blood through the abdominal viscera will augment the biliary secretion. For instance, a full meal increases the quantity of blood in the abdominal viscera, and the secretion of bile is immediately increased. The bile begins to discharge so soon as the stomach is filled with food, and reaches its maximum after the fourth hour. It has been suggested that the mucin contained in the bile is a substance similar to secretin, or a hormone accumulated during the period when the gall-bladder is inactive. When the stomach is filled with food, the secretin or hormone begins to perform its function. In a few hours the mucin or secretin gradually becomes less, but until the bile has ceased discharging it is found present. The administration of gamboge will irritate the gastric and duodenal mucosa and thus cause an increased quantity of blood to circulate through the abdominal viscera. Under these circumstances no increase in the biliary secretion occurs, hence there must be a different action dependent upon the effect of the secretin or hormone, and not upon the quantity of blood circulating.

As to surgery, when medical treatment has proven ineffective. In a recent paper Mayo shows forty per cent of cures from cholecystostomy, and seventy-one per cent from cholecystectomy. Of the cholecystostomy cases, only forty-eight per cent were found to have biliary concretions when the gall-bladder was opened. Thus more than fifty per cent of the patients merely had symptoms or manifestations resembling those due to gall-stones. In the cholecystectomy cases there were also a number without gall-stones, which would reduce the cured gall-stone cases to approximately twenty-five per cent. Therefore it would appear that medical treatment is indicated in at least seventy-five per cent of cases, if

the presence of gall-stones may be considered the basis of surgical intervention.

There should be a correction of all mechanical predisposing causes of biliary concretions, such as pressure from various anatomical displacements, etc. Regulation of the diet is of the utmost importance. If, as has been claimed, biliary concretions owe their origin to the increased acidity or alkalinity of faulty metabolism, then proper correction by dietary and hygienic measures would be the height of wisdom. That the patient should be placed upon a strictly antiuric acid dietary seems absolutely essential.

If increased activity and regulation of the biliary secretion can be obtained through the action of the hormones, then it would seem that organotherapy should be decidedly beneficial in restoring and maintaining the secretion to the normal standard. It must not be forgotten, however, that the most effective solvent of gall-stones known is normal bile. Where the effects of bacterial invasion can be minimized, and normal biliary secretion reëstablished, decided advantages are gained in the medical treatment of gall-stones.

It must not be inferred from the foregoing that I am trying to maintain the position that surgical intervention is never necessary in the treatment of gall-stones. Where suppuration has ensued, and the patient exhibits unmistakable evidence of decided toxemia, while many times medication may relieve the existing symptoms, drainage may be essential. Under such circumstances the aid of surgery should be invoked, provided permanent improvement is not obtained by medical treatment. In my experience, however, the majority of patients have not exhibited such symptoms. The disease being decidedly of the subacute type, only occasionally have chills, fever, and other manifestations of toxemia been noted in patients with cholecystitis and cholangitis. Moreover, it has been my observation that severe symptoms have occurred oftener in cases in which inspissated bile, rather than the definite formation of gall-stones, represented the essential pathology.

FURTHER EXPERIENCE IN THE TREATMENT OF INTRACRANIAL HEMORRHAGE IN THE NEW-BORN.

In the *Boston Medical and Surgical Journal* of June 29, 1916, GREEN reaches these conclusions:

1. Intracranial hemorrhage in the newborn may be most conveniently classified clinically under two groups—infratentorial and supratentorial.

2. In the infratentorial type of hemorrhage the symptoms and signs are primarily respiratory in character and are probably dependent on the pressure of accumulating blood about the respiratory center in the medulla.

3. In the supratentorial type of hemorrhage the symptoms and signs are primarily convulsive and are probably dependent on the irritation of the motor area by accumulation of the blood over the cerebral convexity.

4. In any case of doubt, diagnosis should be confirmed by exploratory lumbar or cranial puncture, or both.

5. In the infratentorial type of hemorrhage repeated lumbar puncture is probably the best palliative treatment and may prove definitely curative.

6. In the supratentorial type of hemorrhage, the best treatment is incision along the coronal suture at one or both lateral angles of the anterior fontanelle, followed by brief drainage with rubber tissue.

7. More extensive procedures than that above outlined are unnecessary and likely to prove fatal.

8. Early diagnosis, and operation within the first two or three days of life, are essential for the best results, since in such cases the blood still remains fluid and there is prospect of its complete removal by drainage. The prognosis becomes steadily worse as time progresses, since the clotting of a considerable amount of blood makes such complete removal impossible, and even if the baby recovers, there is much greater likelihood of subsequent adhesions and irritative Jacksonian phenomena.

EDITORIAL.

ALCOHOL AND NARCOTICS.

At various times in the past we have called attention in these columns of the GAZETTE to papers more or less scientific in character which have dealt with the subject of alcohol and narcotics, principally with alcohol, and we have endeavored to deal with the matter in a judicial spirit in order that our readers, being medical men, might have presented to them an array of facts upon which they could base their own opinions in regard to the important problems which are at stake. At the present time human beings in all walks of life can be divided into several classes in regard to the matter of the use of alcohol. A very large percentage of the human race employ alcohol in amounts which are moderate, and a comparatively small percentage abuse it by taking it in quantities which are immoderate. At the other extreme we find a comparatively small number of people who not only absolutely condemn its use for themselves, but, with the ardor of fanatics, seek by legislation to prevent its ingestion by all other individuals. There is still another class of persons, and these are very numerous, who rarely employ alcohol in any form but who have no objection to taking it occasionally or to seeing their fellows employ it constantly, provided that its employment is not abused so that others, who have not happened to take this liquid at a given time, do not suffer from the action of the individual. It is from this middle class that those who believe that individual liberty as to food and drink should not be limited receive a good many votes in their support, and it is also from this class that the enthusiastic prohibitionist not rarely obtains a large number of recruits.

The problems connected with the use of alcohol are so large and numerous that it is manifestly impossible to consider them all in an article like this. Only those points which are most closely associated with medical practice can claim our attention.

In the issue of the *Interstate Medical Journal* for June, 1916, a number of valuable papers upon this subject appeared, and, taking them as a whole, it may be stated that they present fair arguments for and against the use of alcohol, although the active prohibitionist will be disappointed in that they do not go as far as he would like them to. We think that the editor of the *Interstate Medical Journal* sums up the matter pretty fairly when he states that if alcohol, tea, coffee, and tobacco are swarming with the death-dealing qualities, which some writers say they are, then a very limited quantity of each would be a poison, but this is not true since in many instances the sane use of them results in a physical and mental relaxation that has nothing objectionable about it or harmful to the system, except in the thought of some easy-chair philosopher whose mind is bathed in the turbid waters of Puritanism.

One of the most interesting papers is that which is contributed by Patrick, Professor of Philosophy of the University of Iowa. Concerning the use of alcohol, tea, coffee, and tobacco, he states that it is strange that in all the great mass of writings on this subject so little attention has been given to the psychological problem, which is fundamentally the whole discussion, namely, the problem of the cause of the desire for these drugs. He points out that the American people are now consuming annually about two thousand million gallons of alcoholic liquors, half a thousand million pounds of tobacco, a thousand million pounds of coffee, and nearly a hundred million pounds of tea, and if this is the case it must be evident that these substances are taken not as luxuries or as evidences of vice, but that the demand is rooted somewhere in the brain cells of human beings.

It is interesting to note that the physiological action of these several substances is not only different in degree but different in kind. It has been proved beyond all doubt that alcohol diminishes functional efficiency in practically every portion of the body. These facts have been used by those who

condemn the use of this drug as indicating that it should never be employed, whereas, as a matter of fact, these facts indicate only that it should not be employed when full efficiency is desired, and that it may often be employed with advantage as an agent of relaxation and for the purpose of benumbing or controlling mental or nervous phenomena, which have been put into excessive activity under the stress of daily life. On the other hand, all the scientific investigations which have been made, which are worthy of credence, show that tea and coffee are stimulant in their effects, and within certain bounds, if associated with proper food and rest, actually temporarily increase efficiency without harm, but the man who uses alcohol when at work does not take it to diminish his efficiency, and certainly the ordinary individual who works for some one else rarely manifests a desire to take tea or coffee to increase his efficiency. As a matter of fact, therefore, persons who use these drugs have found by experience that their employment in moderation adds to the comfort of existence, and while they may not be able to give very lucid descriptions of the feelings which these drugs induce, the fact that they are so universally employed is a tribute to their good effects. It is also possible that the use of all these substances, whether they be stimulant or depressant in their nature, seem advantageous to the economy in that they diminish activity in parts which have been excessively active and increase activity in other parts of the body, which, for the time being, have been quiescent. As Patrick puts it, alcohol places a temporary quietus upon the higher control of the brain centers and sets free the older and more basal centers, and so is a release from the burdens of the modern strenuous life.

Again, it is well known amongst active mental workers that prolonged and intense cerebral activity produces a certain amount of cerebral congestion with a corresponding anemia of the feet. When the time comes for ceasing work the brain tends to continue in its activity and the feet are cold. Under these circumstances the use of a moderate quantity of alcohol, by relaxing the blood-vessels in other parts of the body than the brain, equalizes the circulation, draws blood away from the brain, permits rest, and often causes sleep. To quote Patrick again, "alcohol and tobacco are generally an easy means of rest and relaxation; putting to sleep in a measure the higher brain centers while allowing the needed activity of the lower ones."

We come in contact, of course, at this point with the important factor of common sense, both as to work and relaxation. The man who works to excess, mentally or physically, does himself harm, and he who uses alcohol, or any other drug, to compensate for such excess is simply putting aside the evil day of reckoning. If he goes so far as to employ these substances in inordinately large quantities he does not put off the day of reckoning but actually hurries its approach. In other words, moderation in all things, whether it be in work, in drink, or in food, is essential for the preservation of health.

At this point those who are opposed to the use of alcohol and the other drugs that we have named state that the fundamental difficulty lies in the fact that certain human beings are unable to exercise self-control, and that under these circumstances laws should be passed which will control them. The vast majority of persons who take alcohol, tobacco, tea, and coffee do exercise self-control, and only a comparatively few consistently step over the boundary line of common sense in their use. Many of these persons are distinctly abnormal and the recognition of this fact is one of the reasons why many physicians and others do not believe that laws should control the personal liberty of the many for the benefit of a comparatively few, who are imperfect.

In this connection a paper by White, who is Superintendent of the Government Hospital for the Insane in Washington, is to the point. He believes that alcohol is not a habit-forming drug, but rather that its use in excess—that is, to the degree to produce what is known as alcoholism—is a symptom of some underlying functional condition

which has escaped our notice, and he quotes Haycraft, who, after making a statistical study of the effects produced by prohibition in several States, found that as the consumption of alcohol had been diminished and as drunkenness had been lessened, the admissions to the insane asylums and poorhouses had progressively and correspondingly increased. In other words, the conclusion would seem to be that given a number of mental defectives these persons, when unable to indulge in alcohol, nevertheless progressively diminish in efficiency and develop frank mental disease, or that type of deficiency which leads to pauperism. White is convinced of the truth of this view and quotes the President of the Society of the Study of Inebriety as having positively stated that he had never seen an inebriate who, aside from his inebriety, was a normal man. White believes that inebriety is to be considered as a neurosis, characterized by an all-pervading feeling of inefficiency, and he considers that this inefficiency is characteristic of the man who abuses alcohol. He is incapable of meeting reality efficiently every day. He may be able to deal with the problem of reality for a greater or less length of time, but continuity of effort, day in and day out, is foreign to the alcoholic character. We think that most physicians of experience will agree with this view. It is his desire, being abnormal, to fly to the cover of the narcotic to escape the overburdening oppression of reality, and the fully developed type of this individual is he who, not drinking with his fellows, every now and then shuts himself up in his room and drinks himself into unconsciousness. Alcohol, therefore, does not produce a habit, but a habit of mind, and a deficient morale induces a more or less habitual use of the drug. It would seem to be evident, therefore, that Morris is pretty nearly correct when he states that alcohol does about everything that its friends claim for it and about everything that its enemies claim for it, depending, of course, upon the person who uses it and how it is used.

Concerning the important question of the influence of alcohol upon heredity, there are two other papers which must be considered, and which approach the subject from somewhat different points of view. One of these is contributed by Stockard, who has used an immense number of guinea-pigs in an endeavor to determine whether alcoholism in the parent influences the offspring. It is evident, of course, that results obtained in the offspring of guinea-pigs which have been subjected to the influence of alcohol may be quite different from the effects which develop in the offspring of human beings who abuse this drug. It is conceivable that alcohol may affect the development of the guinea-pig as differently from the development of the human being as hay as food would affect the guinea-pig as compared to its effect if ingested by man, and it would seem probable that the history of the human race proves pretty conclusively that alcohol taken by either parent does not exercise the deleterious effect upon the offspring in human beings that it does in guinea-pigs. If it did the number of defectives in the children of alcoholics would be far greater than it is.

Stockard's experiments are of great interest and add great value to our knowledge of an important subject, but they do not afford actual evidence as to the effect of alcohol upon human heredity. Aside from the difference as to the effect of alcohol in guinea-pigs and human beings, it is to be noted that very few human beings who reproduce are as completely alcoholized at the time of impregnation as were Stockard's guinea-pigs, since these animals were kept for days and weeks in a condition of chronic intoxication. Furthermore, Stockard found that the dose of alcohol, which he wished to give, when administered by the stomach produced such deleterious effects upon his animals that this method of administration could not be employed, and he therefore devised a method by which the animals were exposed to the fumes of alcohol while in their cages. The drug was taken into their bodies therefore when they breathed the vapor of the drug through their lungs, and not by their stomach and through the liver.

As the liver is the great oxidizing organ of the body it is quite conceivable that the action of alcohol vapor continually inhaled may produce very different results from alcohol taken by the mouth in more or less widely separated drinks, and this is the more likely when we find, to use the words of the author, that "several of the guinea-pigs have been treated with the fumes of alcohol almost to the point of intoxication for six days per week for a period of five years." It is not surprising that under these circumstances the progeny of these animals, in many instances, died soon after birth, or were disitnctly defective at birth, but it is surprising that he was unable to find anything abnormal in the heart, stomach, lungs, kidney, and other organs that might not be found in a normal individual. This proves that alcohol by the lungs and alcohol by the mouth produces different effects. His belief would be that alcohol, taken in the way in which he gave it, influences the germ cells but not the tissues of the vital organs.

It is interesting in comparison with this experimental study to note the conclusions of Goddard, who is the Director of the Department of Research of the Training School for Feeble-minded Children at Vineland, N. J. He takes issue with Stockard's conclusions as to the effect of alcohol upon heredity. Studying human beings he found that alcoholic parents average 5.5 children to a mating and the non-alcoholic average 4.1. Analyzing these two groups, which consisted of several thousand children, he found that in the alcoholic group 31 per cent were feeble-minded, whereas in the non-alcoholic group only 18 per cent were feeble-minded. While at the first glance this would seem to indicate that alcoholics are predisposed to the production of feeble-minded children, it must not be forgotten that those parents who used alcohol to excess were, in the great majority of cases, more or less defective, because if they had not been defective they would not have abused the drug, and therefore Goddard concludes, as a result of his investigation in human beings in distinction from guinea-pigs, that alcoholism is to a very large extent due to feeble-mindedness, and furthermore, that his statistics have failed to show that alcoholism of the parents causes feeble-mindedness in the children. He believes that this feeble-mindedness is accounted for by heredity and neuropathic ancestry, and he well says that at the present time the facts at hand do not permit the solution of the important question of the effect of alcohol upon the health of offspring.

DIAGNOSIS AND TREATMENT.

Practically all of the laity seem to believe more thoroughly in the selective affinity of drugs for diseased tissue than do medical men, although the laity have no scientific knowledge and medical men possess a good deal of it. Occasionally one meets with a practitioner whose abiding faith in this selective affinity is encouraging, were it not that he has little or no scientific basis for his view. In some instances what has appeared to be the result of the selective affinity of a drug for a diseased tissue is nothing more than a coincidence, or some change takes place in the function of certain organs of the body as a result of natural processes and not directly the result of the administration of the drug or drugs.

These preliminary remarks are made for the purpose of insisting upon the obtaining of an accurate diagnosis, whenever this is possible, before remedial measures are resorted to, since otherwise the treatment is haphazard, to say the least, and in the great majority of cases must inevitably fail. It is true that not infrequently drugs may be given for the relief of pressing symptoms with success, and this may lead the practitioner and the patient into the belief that a cure has been effected. This belief, as a rule, ultimately results in disappointment, since nothing has been done for the relief of the underlying condition. Headache, neuralgia, impaired digestion, cardiac irritability or irregularity, can, all of them, be temporarily relieved, to some extent at least, by the use of certain drugs, but they will not be

permanently relieved unless the underlying anemia in some cases, gouty tendencies in others, or constipation in still a third class of cases, is corrected.

There are two general classes of cases in which thorough methods of diagnosis are not as frequenlty resorted to as they should be before the institution of treatment. It not infrequently happens that the urine of a patient is examined only once, and, still worse, that this sample is that of only one urination rather than a sample from a twenty-four-hour specimen. Such an examination may lead to the belief that there is nothing wrong with the kidneys, or, on the other hand, a particularly bad specimen may give rise to the opinion that the kidney condition is exceedingly grave. Not only is this true but the reaction of the urine, and the time that it is kept, are not so important in themselves as in the influence which these factors may exercise upon the discovery of casts. Thus, it sometimes happens that a twenty-four-hour specimen of urine which is alkaline is found to be quite free from casts because the casts have been dissolved in the alkaline liquid, whereas if the urine were examined immediately after it is passed, or maintained at proper temperature to prevent putrefactive change, or again acidulated to preserve it, an entirely different urinary report would be obtained and a different idea of the complexion of the case would be formed in the physician's mind.

So, too, in cardiovascular disease the estimation of the blood-pressure and the action of the heart of a patient on a single occasion, particularly when he is being examined for the first time, and if he has walked to the doctor's office, may give an entirely erroneous conception of the average condition of the patient and lead to the institution of active therapeutic measures which are excessive for the patient's ordinary needs, or which, perhaps, are not needed at all.

The demand on the part of the physician for a number of twenty-four-hour samples of urine, or his request that a number of cardiovascular examinations should be made before he is asked to express an opinion and direct treatment, is often received with disfavor by the patient, who naturally is impatient of delay and who has no idea of the various problems involved in the proper investigation of his case.

On the other hand, while the investigation of a case with instruments of precision or by laboratory methods is wise, in many instances, it is a noteworthy fact that he who is particularly adept as to laboratory detail is often unsuccessful because he has not trained himself to regard the patient as an individual with peculiarities, or one presenting the picture of a definite type of disease.

In other words, it is necessary for the modern medical man to balance the older methods of clinical observation with laboratory and instrumental control.

So, too, it not infrequently happens that a patient will present predominant symptoms in a given organ which are not due to any primary disease of that organ, but which are secondary to a lesion or lesions elsewhere. It is by no means uncommon to see a case of chronic bronchitis treated with various expectorants for weeks without results, when a thorough examination of the patient would have revealed that the bronchitis was really due to some condition of the heart or kidneys, and so it will happen that one physician will fail to relieve a patient suffering from this type of bronchitis by the use of expectorants, whereas a more careful man will immediately give him relief through the employment of rest and digitalis.

Not long since, as illustrative of the need of careful examination before prescribing, the writer of this note saw a man of fifty odd years, with a life history which would predispose to the development of angina pectoris, who complained of severe pain in the chest, about his heart, and radiating down his left arm, which was increased by exercise or the taking of a full breath. The administration of the nitrites gave no relief, but twenty-four hours later, when the patient arose in the morning, he found a sharply defined line of irritation extending

along the margin of his fifth rib, and then it became evident that the attack of so-called angina was in reality a herpes zoster. The possibility of herpes zoster is also to be regarded in severe cases of supraorbital neuralgia which has lasted for only a few hours.

Last of all, as opposed to carelessness in the reaching of a correct diagnosis on the part of a physician, we must bear in mind the difficulties which are presented by reason of the fact that not infrequently a patient deliberately misleads the physician by stating a falsehood, or else is so uncommunicative that it is almost impossible to gain accurate information. Very rarely an individual is met with who has so little power of self-observation that he is unable to make statements which are correct concerning himself, or describes his symptoms in a way which makes diagnosis impossible.

The whole point of this article is to emphasize the fact that although it is very easy to write a prescription with the hope of producing a cure, it is important not to write this prescription until the case has been sufficiently carefully investigated to give one a reasonable right to hope that good results will ensue.

THE VALUE OF THE BROMIDES IN THE TREATMENT OF EPILEPSY.

Aside from measures devoted to the regulation of the diet and the maintenance, as nearly as possible, of a good nervous equilibrium, it may be truthfully said that we can do little for the relief of idiopathic epilepsy, particularly by the administration of drugs. Many years ago, as the result of a careful investigation of this subject, it seemed to us clear that the bromides, although only palliative remedies, nevertheless occupied the highest place in the drug treatment of this malady, and in summarizing our knowledge at that time the writer of this note pointed out that, while every voice in the profession supported the use of the bromides, these drugs were not to be considered as curative. Some years later we published in the THERAPEUTIC GAZETTE facts brought together by collective investigation carried out amongst the superintendents, or general medical officers, of asylums for the insane and epileptic. This collective investigation showed very conclusively that no one believed that the bromides were at all curative in their influence, and also revealed the fact that all too frequently the general practitioner was in the habit of administering these remedies over too long periods of time or in such large doses as to make their ultimate effect distinctly deleterious. Indeed, at least one of the institutional medical officers, to whom we have referred, expressed the belief that if the profession in general could be taught the wisdom of refraining to a large extent from the administration of the bromides to epileptics, a distinct service would be rendered to these unfortunates.

Still later we called attention to certain types of maniacal disturbance which very occasionally occur in persons who have an idiosyncrasy to the bromides. Thus, Weir Mitchell reported the case of a woman who while in Paris became violently insane while taking the bromides, these symptoms continuing until her return to this country, when, on ceasing the bromides, her mind recovered. These cases are very rare and are diametrically opposed to the very common instances of mental failure or dementia which are met with in patients who have been saturated with these remedies. In many instances the mental failure is attributed in a large degree to the epilepsy, when, in reality, it is due to the drug.

In the *Medical Review of Reviews* for July, 1916, Shanahan, who is in charge of the Epileptic Asylum at Sonyea, N. Y., wrote upon this topic and insists upon the view that epilepsy is a disease of the whole man and not of any one organ or system of organs. He insists upon the moral treatment of epileptics in regard to self-control, personal discipline, and strict rules of conduct, and he also states that the bromides may mask symptoms of the underlying causes of disorder. This is particularly to be borne in mind when treating patients who have paroxysms at long

intervals and, therefore, take an immense amount of bromide needlessly during the intervening periods.

Again, it is important to remember that if an epileptic who has been taking full doses of bromide stops taking them there is often an increase in the number of seizures and not infrequently a true status epilepticus develops. It is evident, therefore, that when these drugs are to be stopped in a case of epilepsy they should be withdrawn gradually and not at once.

Finally, Shanahan presented the following interesting facts. He stated that in the Craig Colony for Epileptics the average amount of bromine and bromide salts used per patient during the year 1902 was 10.8 ounces, and the average number of seizures during that year was 98. In the year 1904 the average dosage was 15.6 ounces, and the average number of seizures 124. In 1906 the average dosage per patient during the year was 12.2 ounces and the average number of seizures 136. Since 1908 there has been a marked lessening in the administration of the bromides, so that the average dose for the entire year has been less than half an ounce, and it is interesting to note that with this remarkable reduction in the amount of bromides there has not been an increase in the average number of seizures. On the contrary, during 1915 there were 95 attacks with the average per capita dosage of bromide at 0.45 of an ounce.

How much this remarkable change, as represented by these statistics, depends upon other factors than diminished use of the bromides is open for debate. It is conceivable that the institution may have been fortunate in having a fairly large number of patients who only have paroxysms at long intervals, or who may have received other treatment when they had not as yet passed into a state of chronic epilepsy. Furthermore, Shanahan's statistics are hardly complete without more information in regard to the age of the patients, since epileptics who have reached mature years are notoriously less responsive to treatment than young persons and, as a rule, present signs of mental and nervous deterioration.

Whatever the correct conclusion may be in detail it would seem evident that bromides cannot be used in epilepsy carelessly and that their effect should be closely watched.

This editorial note was written before we received for publication the article by Dr. Shanahan which appears in this issue. His communication is so practical and useful that we desire to call attention to it in these columns.

THE RESULTS OF TREATMENT IN FRACTURE OF THE LEG.

Since the gauge of treatment lies in the percentage of good functional and, if possible, cosmetic end results, an adequate series of cases carefully observed and systematically reported is always of major interest. Hence Clough's (*The Journal-Lancet*, Sept. 1, 1916) series of 100 cases of fractured leg which occurred amongst underground workers for a mining company is important because he has so carefully treated them and because accurate records have been kept of all time lost from work; therefore the period and degree of disability can be accurately determined. The injuries he studied were mainly due to rolling rocks, and for the most part the tissues were not crushed lifeless as in railroad work; yet because of the heavy jagged rocks the most serious kinds of compound fractures were produced. Most of the fractures occurred between the twentieth and the fortieth year, these probably representing the average age of the larger number of employees. There was no difference in the two sides of the body.

The author tabulates the average time lost according to the kind of fracture. This is something over 71 days in simple fractures, 108 days in simple comminuted fractures, and 163 days in compound comminuted fractures. When both bones are broken simple fractures result in the loss of 117½ days, comminuted fractures 119.9 days, and compound comminuted 168½ days. It is noted that for every dollar the workman loses in wages the company spends an equal amount in getting him well.

On this basis it is possible to work out, in dollars and cents, the cost of these injuries. The average wage paid to underground workers by the company is $3.25 per day. The total net cost of a simple fracture is $395; of a comminuted fracture $594; of a compound comminuted $899; simple fractures of both bones cost $645; compound comminuted of both bones cost $926. The shortest case when both bones were involved cost $416, and the longest case cost $1841; the average case costing $542.

Conservative methods were followed as far as possible. There were three deaths—one from pyemia, one from pulmonary tuberculosis, and one from pneumonia.

On several occasions while waiting for wounds in compound fractures to heal in order to permit of operative methods on the bone, nature stepped in and good union was obtained where it was supposed that the suppurative process was too great to permit of formation of callus. As a result of this the writer is certain that many cases of delayed union at the end of six or eight weeks would have later become solid by conservative methods had they not been operated upon when they were found springy. He is strongly of the opinion that, if repeated efforts are made, the great majority of recent fractures of the leg can be put into line and held there by conservative methods.

Absolute anatomic reduction is not necessary in recent fractures of the leg, nor is the healing process accelerated by accurate apposition. If the fractured ends are side-slipped a third or even a trifle more a stronger callus is thrown out, and ultimately the callus becomes smoothed down, the lines of force of the bone become readjusted to new conditions, and inside of two years it is impossible to tell by appearances where the fracture occurred, and all the *x*-ray shows at this late date is a slight thickening of the cortex at the seat of the old injury. It requires as much experience and greater attention to detail to handle fractures by the conservative method as by the open method.

The majority of cases were reduced under ether anesthesia. Most of the men were dirty when hurt, and the legs were washed before applying splints. If a wound was present, it was temporarily covered during the washing process, and then swabbed around the edges either with soap and water or, more recently, with iodine. No appreciable superiority has been seen in either method. No attempt was made to wash the wound below the surface, and common sense teaches the removal of any foreign bodies. Splints were made of pasteboard, one on each side of the leg. When a part reached normal size the pasteboard splints were replaced with the ordinary plaster-of-Paris casing, which remained *in situ* until good union was secured. This case is cut open immediately after being put on, and is wrapped with a muslin bandage, in order to allow for any possible swelling.

Almost without exception every patient returned to the same class of work he was doing before the receipt of the injury. Very oblique fractures were the most difficult to handle.

Whilst the anatomical results have not always been ideal, the functional results have been satisfactory. Fractures involving the upper part of the leg are always characterized by slow union.

Tetanus has never occurred in over 30,000 recorded accident cases, hence no antitetanic serum was administered as a prophylactic measure. The author is unable to find a single instance of tetanus reported by mining surgeons, from which he concludes that the germ does not live under ground. Six patients in all were operated upon—two for non-union, two because they could not be reduced, and in two amputation following infection was required.

It will be remembered that Championnière rudely disturbed the accepted belief in regard to the proper treatment of fracture in that he urged mobilization in place of fixation, holding that the latter if absolute retarded or even prevented union. It is quite true that function is the immediate object of the treatment; that the sooner and the more completely it is restored the more successful the treatment; and that Championnière had in view the preservation

of the soft parts without interfering with the union of the bone when he argued so strenuously against immobilization. In so far as massage is used in the treatment of fractures, and this applies both to the period shortly following injury and to that later period when efforts are made to increase a limited motion, its efficiency depends upon its painlessness and the sense of relief experienced by the patient after its application. If these two requisites be kept in mind there is no reason why massage should not be applied immediately after the infliction of the fracture. Indeed there are a number of reasons why it should be so used, since it encourages local circulation and thus the rapid absorption of clot and the formation of granulation tissue and of callus.

Bardenheuer's method of treatment is based on traction. Properly applied it avoids muscular stiffness and joint adhesions and allows of massage and passive movements, and is attended by the minimum muscular atrophy and leads to a very accurate adjustment of the fragments, although, of course, they are practically almost never immobilized. Such traction is applied as is adequate for the reduction of the deformity; the pull may be in one, two, or three directions, according to the indications. The method is fairly easy of application even to the upper extremity; and sometimes the only one which will secure and maintain a proper reduction in fracture of the surgical neck of the humerus.

BRAIN TUMOR.

To those at all familiar with the clinical aspects of brain tumors, their distressing progress, their fatal termination, and with the somewhat appalling mortality of surgical intervention, the summarization of the work of a single clinic is of real and practical interest. Thus the excellent clinical study of this lesion based on 70 carefully studied cases contributed by Heuer and Dandy from the surgical service of the Johns Hopkins Hospital (*Johns Hopkins Hospital Bulletin*, No. 306, 1916) is worthy of careful reading and of high commendation. Of the thirty cerebral and brain stem tumors certified by operation or autopsy, including tuberculoma, cyst, endothelioma, glioma, aneurism, and internal hemorrhagic pachymeningitis, 27 were operated on, with a mortality of something over 6 per cent, a case mortality of something over 7.4 per cent, and with 8 apparently well on discharge.

Of 12 cerebellar and cerebellopontine tumors certified by operation or autopsy, of which 6 were cysts, 1 a cyst glioma, 1 a glioma, 2 endotheliomata, and 1 an instance of ependymitis with internal hydrocephalus, 11 were operated upon, with an operative mortality of something over 15 per cent, a case mortality of 18 per cent. Six of these were apparently well on discharge.

Of 16 presumed cerebral tumors, not certified, 15 cases were operated upon without operative mortality, and 10 improved; the operations being exploratory decompression, or being limited to, in one case, ventricular puncture. Of 12 presumed cerebellar and cerebellopontine tumors not certified, 9 were operated upon, 4 being reported not improved. The operative case mortality was 22 per cent. There was no operative mortality in the presumed cerebral tumors.

The reasons for including conditions other than tumor in the tabulation are based on the circumstance that the symptoms so closely simulated those of tumor that operations were usually performed under the supposition that new growth was present. Taking the total number there were six deaths occurring between twenty-four hours and five days after operation—an operative mortality of 8.6 per cent. Two patients subsequently died in the hospital, this termination being apparently uninfluenced by operative procedures. There was a complete operative mortality of 11 per cent. No case died on the operating table.

In 33 cases the lesion was disclosed at operation—that is, in 53 per cent of the cases operated upon. The operation consisted in attempting to remove the lesion in

28 cases; in 7 the removal was but a partial one. Gliomata formed 50 per cent of the total lesion in the series reported. Of the gliomata 6 were cortical, 7 subcortical. In consistence they varied from relatively hard to extremely soft gelatinous growths resembling a colloid carcinoma.

Of 11 cysts, 7 belonged to the group of simple serous cysts, 1 arose from an embryonal anlage, and three were arachnoidal cysts. Five of the 7 simple cysts arose in the cerebellum. They exhibited gelatinous walls usually separated from the surrounding brain tissue and a yellowish or slightly brownish fluid which, rich in fibrin, rapidly clotted on exposure to the air. The arachnoidal cysts usually arise as a consequence of infection, as from the ear or from trauma. They represent a local collection of the cerebrospinal fluid enclosed by thickened, opaque pia-arachnoid. Distended cisternæ should not be mistaken for these cysts. Four cases of endothelioma serve to illustrate the fact that they may be multiple, and unless removed with a wide area of attached dura they are prone to recurrence. At times these tumors are bilateral in the cerebellopontile angles. Of the tuberculomata both were solitary tumors.

The authors reëmphasize two of the possible causes of late interference in brain tumor cases. It has been repeatedly noted, yet it is not generally known to the profession, that even a high grade of choked disk is not incompatible with good vision. It is probable that if surgical measures were contemplated and indeed applied as soon as choked disk can be diagnosed blindness would in a large measure be prevented. The demonstration of a normal visual acuity, as tested in the normal way, should not be taken as ruling out visual disturbance; it is only by careful perimetric examinations that early disturbances in vision can be demonstrated. Contractions in the color field occur before alterations in the fields for form; and both may occur long before visual acuity as tested is demonstrably affected.

The assumption, still too prevalent, that intracranial lesions are commonly of syphilitic origin is another cause of delay in bringing cases into surgical hands. Cerebral syphilomata are rather uncommon as compared with the true tumors. The Wassermann test was made in 52 cases; positive in but three. The absence of the positive Wassermann reaction, with one exception, in a series of 28 certified cases of true tumor, argues well for the value of this test in excluding luetic lesions. Of course syphilis and brain tumor may coexist. The *x*-ray still finds its greatest field of usefulness in the diagnosis of hypophyseal lesions not only in their localization, but, in the associated deformities of the sella turcica, in the determination of their size, direction of growth, and occasionally of their character. Tumors producing a definite shadow are, unfortunately, uncommon, but changes in the skull, such as erosion or thickening, vascular changes, or changes more or less characteristic of internal hydrocephalus, are not infrequent.

The demonstration of an internal hydrocephalus is valuable in cases in which a differential diagnosis between supra- and subtentorial lesion is uncertain. *X*-ray plates are helpful. More certain information is obtained from ventricular puncture, which may be done with or without the injection of phthalein. The only precaution needful is to open the dura sufficiently to see that a cortical vessel is not injured by the introduction of the blunt needle.

As to the operative technique, the approach to lesions and the safe closure of wounds are perhaps of greater importance than similar steps in the treatment of lesions elsewhere in the body. Hemorrhage is one of the most potent factors in the high mortality attending cranial surgery. In 150 cranioplastic operations for brain tumor and epilepsy, a reëlevation of the bone flap was necessary only once because of postoperative bleeding; and in the same number of cases a two-stage operation was necessary but once because of hemorrhage. The authors attribute the absence of postoperative pneumonia to the use of intratracheal anesthesia.

In the treatment of intracranial tumors

only four types of operations may be considered: a decompressive craniectomy done for the relief of pressure symptoms in cases of unlocalizable tumors; an osteoplastic resection for the exposure of cerebral tumors (often combined with a decompression); a cerebellar exploratory and decompressive craniectomy for tumors of the cerebellum and cerebellopontine angles; and the nasal or intracranial operation for the exposure of hypophyseal tumors. In the treatment of cerebral and cerebellar lesions the authors have followed the procedures as developed by Cushing. The subtemporal method of decompression seems the operation of choice for the relief of pressure symptoms due to cerebral tumors. It seems to make no difference whether the subtemporal defect be made over the supposed side of the lesion or upon the opposite side. In spite of great care in the formation of the defect, a temporary aphasia has followed a left subtemporal decompression in two instances.

In the treatment of hypophyseal lesions the nasal approach has been most strongly advocated and most frequently used. Cushing has used this largely; of 124 operations upon 95 patients he has used the nasal approach 111 times. Von Eiselsberg always employs the nasal approach.

Bleeding which resists all efforts for its control, a badly taken anesthetic, or an unusually tense dura, may determine one to abandon the operation for a second sitting, but such complication should be the exception rather than the rule as demonstrated by Cushing's and the present series. In 71 operations done on 62 patients, a two-stage operation was necessary in but a single case, in which a mistaken *x*-ray diagnosis of osteoma of the skull led to an attempt to remove an area of extremely vascular hypertrophied bone before discovering the underlying tumor. None of the six deaths in this series could be ascribed to hemorrhage or shock; and in none of the patients that recovered was the condition such that a blood transfusion was deemed advisable. Careful control of the hemorrhage during approach and careful subsequent closure of the wound were the determining factors in the favorable result.

As to the anesthetic, ether alone has been administered by the usual drop method and by intracheal insufflation. The difficulties attendant upon the brain tumor cases have been very largely eliminated. A smooth, even anesthesia, without straining or cyanosis, is the rule. There is also thus provided an easy method of artificial respiration without change of apparatus should respiratory palsy occur. The authors have discarded the tourniquet around the head and prefer to clip the bleeding points in the scalp, securing these latter by skin suture. Hemorrhage of the bone is controlled by wax, and from the dura by ligature or the silver clips. Under conditions of increased intracranial tension, the opening of the dura becomes an important step in the operation and may result in rupture of the cortex or sudden dislocation of structures leading to respiratory paralysis. The relief of tension may be accomplished usually by one of four procedures having for their purpose the withdrawal of cerebrospinal fluid; ventricular puncture, lumbar puncture, tapping of the posterior median cisterna, and the gradual withdrawal of fluid between the meninges through a minute opening in the dura. Of these procedures ventricular puncture has perhaps the greatest field of usefulness, being applicable for the relief of dural tension in both cerebral and cerebellar explorations. In the location of subcortical lesions palpation and aspiration are our most useful aids; occasionally the local flattening and widening of the convolutions over a growth give an indication of its presence. Palpation of the cortex is difficult and often misleading. By the use of palpation and aspiration nine subcortical cysts or cystic gliomata were discovered.

Although our chances of a cure by extirpation of the tumor are at present few, practically every operation may be converted into a palliative procedure; and in fully 50 per cent of all cases amelioration may be expected. Glioma, the most common type of cerebral tumor, is the most

unfavorable for operative removal, though occasionally it may be shelled out. Endotheliomata are distinctly favorable tumors for surgical removal. They are often very vascular and difficult of approach, since they elect the cerebellopontine angle. Moreover, these encapsulated tumors may be firmly attached by a pedunculated or sessile base to the meninges; and unless the base or origin of the growth is removed, there remains the possibility of local recurrence.

Since cysts tend to refill after evacuation the wall should be removed. Transplantation of fascia has been a helpful procedure used to cover large dural defects left after the removal of tumors.

REPORTS ON THERAPEUTIC PROGRESS.

SOME OF THE USES AND ABUSES OF MASSAGE.

Writing in the *Lancet* of July 8, 1916, CLAYTON says now that massage is used to such a large extent in the military hospitals it seems necessary to point out some of the dangers of using it indiscriminately in all cases. Thus to give massage continuously for months to a patient with a functional paralysis would tend to keep up the disability rather than cure it, because the massage continually reminds the patient of his condition. On the other hand, where a nerve is injured and the muscles it supplies are paralyzed massage is strongly indicated to prevent atrophy and contractures. The following are the treatments which Clayton has found most successful for some of the commoner disabilities that are treated in military hospitals:

1. *Functional paralysis.* In many cases these patients have a considerable amount of rigidity of the back and legs, and this prevents them from sitting up. It is perfectly hopeless to try to cure them with massage. From the start-off efforts should be made to teach the patient to stand and walk. At first two strong assistants are required to hold him up, and usually he cannot move one leg in front of the other. Massage and faradism should be given for the first week or two in addition to the walking exercises, in order to stimulate his muscles and persuade him that he is being helped with treatment. But these must be given up at an early date whether they succeed or not, as they tend after a time to hinder progress. Frequently the patient learns to stand and walk with assistance before the rigidity in his back has passed off sufficiently to allow him to sit up. As soon as possible he should practice walking by himself in some walking machine. Here we have two long parallel bars at such a height and such a width apart that the patient can rest his arms on them comfortably while trying to get his balance. The next stage is to learn to walk in this apparatus without using his arms for support. Finally, when made to walk in the open in all probability he will tend to walk in a circle, but with further training he should learn to walk properly. During all this time he is given exercise on his bed or in a chair for his limbs and trunk, and it is very essential for the masseur to be always very optimistic and suggest to him in various ways that he is improving daily. It is a great mistake to try to get rid of the rigidity and restore muscular power before getting him on his feet. Massage may be continued for months with this object in view without getting any result.

2. *Paralyzed muscles.* (*a*) Due to nerve injuries. The paralyzed muscles should be treated with stimulating massage and galvanism. Passive movements must be given daily to the joints to prevent stiffness, especially if splints are being worn to relax the paralyzed muscles. In addition to this the slightest sign of return of power must be encouraged by giving assisted and active movements to these muscles until they are sufficiently strong for the patient to do exercises by himself. He should then continue with regular exercises until the normal power has returned.

(*b*) Functional. These cases must be treated on the same lines as functional paraplegia. A little massage and faradism at first to stimulate the muscles and suggest to the patient that he is being treated. If this fails to produce any active movement after a short time the treatment must be discontinued and something else tried. Frequently after faradism the patient finds he can do a little active movement. This can be gradually increased and developed by making him practice movements until the full power returns. The success or failure of these cases depends to a large extent on the masseur. He or she must impress on the patient that the treatment is really effecting a cure. Other functional conditions should be treated on the same lines. Massage, if used, is merely to act by suggesting to the patient that he is being treated and recovering.

3. *Flabby heart.* This may either occur after a long illness, such as typhoid fever, or may be the "soldier's heart" due to overstrain. These cases respond well to graduated exercises. In the early stage when the patient is still in bed, massage, in the form of kneading, to the limbs should be also given. Breathing exercises form an important part of the treatment, and the patient should be taught to breathe slowly and evenly while performing the other movements. In almost every case the pulse-rate, if rapid at first, falls during and after the exercises, and it also becomes stronger.

The following is an example of a scheme of treatment ordered for a patient who is still confined in bed: (1) Six deep breaths; (2) arm kneading followed by active elbow flexion and extension (six times); (3) six deep breaths; (4) leg kneading followed by active ankle flexion and extension (six times); (5) six deep breaths. This treatment is gradually increased as the patient becomes stronger, body exercises are added, and the massage is discontinued. Finally, the patient walks up a certain number of stairs daily under the supervision of the masseur, in addition to the other exercises.

4. *Joint injuries.* (*a*) After adhesions have been broken down. The joint is usually swollen, stiff, and painful for the first few days. Passive movements should be commenced the following day to prevent adhesions reforming. Gentle soothing stroking down the limb, performed for five minutes before and while the joint is being moved, will often prevent painful contractions of the muscles and so allow of a freer range of movement. No forcing must be allowed. The movements should be very slow and gentle, and the limb well supported so that the muscles can relax.

(*b*) Chronic traumatic synovitis. For this condition exercises are strongly indicated. Even if fluid reaccumulates they should be continued. In addition massage can be given to the joint and the muscles which pass over it, and passive movements until the full range of movement of the joint is established. The exercises should be performed twice a day. Thus for a knee-joint one would give knee flexion and extension (1) sitting and (2) standing. The former exercise will be chiefly for the anterior thigh muscles, and the latter for the posterior. These exercises can be increased by fixing a weight on the patient's foot. Finally, he should do exercises with his weight on the disabled limb. These exercises should be continued until the patient can hop round the room on his injured leg. These same exercises should be given to all cases in which a cartilage has been removed from the knee before the patient returns to duty. To try to redevelop the thigh muscles with massage only is perfectly hopeless, but massage may be helpful in the earlier stages when the limb aches after very little exercise.

It will be noticed that almost all these treatments end in exercises. Clayton considers this to be very important because muscles always atrophy after an injury in their neighborhood. But there is another very important reason. If a patient is given massage for a long period and is not made to make an effort himself he is very liable to develop some functional disability. To take a case, a patient who suffered from bad trench feet, and had been treated for about six months without being allowed to walk,

began to develop a talipes varus and a tremor in his legs on active movement. He was made to walk at once and do exercises on his feet to stop this functional disability. Finally, there are the cases which require no massage, but simply careful examination to find the cause for the continuation of the disability, and then some simple treatment for it.

NITROUS-OXIDE-OXYGEN, THE MOST DANGEROUS ANESTHETIC.

In the *Medical Record* of July 29, 1916, BALDWIN states that Ochsner says he made a careful test with one hundred successive cases of nitrous oxide anesthesia, compared with a similar number of ether anesthesias by the drop method, and "found no difference in the course of the anesthesia, nor in the comfort of the patient, but there was a little more bronchial irritation following operation when nitrous-oxide-oxygen gas had been used." (Absence of bronchial irritation is one of the strong claims made by those who advise this anesthetic.) The method, he says, he found cumbersome, and, therefore, permanently abandoned it. The only special value that he attributed to it is a "slight advertising value which the method undoubtedly possesses." He then speaks of the addition of oxygen to the nitrous oxide gas, and claims for it the same advertising value as for the other, but "possibly to a somewhat greater degree." He then speaks of some of the disadvantages which it has, and finally concludes as follows: "For some time there will be a certain amount of advertising advantage, but as soon as this has been dissipated through the fact that every one will be prepared to administer this form of anesthesia, its drawbacks must become apparent as compared with its advantages."

In Columbus, Ohio, nitrous-oxide-oxygen deaths have occurred at the hands of three administrators, all of whom are looked upon by their friends as thoroughly competent specialists. Deaths have occurred to each in frequency just about in proportion to the number of administrations for major operations. Dr. Rice has lost the largest number, but has undoubtedly had more administrations in major work. Dr. Howell, who has made a personal study of nitrous oxide anesthesia, and has watched many such administrations at Lakeside, Cleveland, and who has until recently used nitrous-oxide-oxygen almost exclusively, tells Baldwin that he regards Dr. Rice as the most skilled nitrous-oxide-oxygen anesthetist in the State. The anesthetist who had but one death had given this anesthesia in about fifty cases.

Baldwin is told by many that while deaths on the table are exceedingly rare from ether, many deaths occur later from pneumonia, which should be charged up to ether. Those who make these statements should certainly read Rovsing, who considers this matter briefly but very forcibly: "It is astonishing, moreover, that the misconception that ether has a harmful influence on the pulmonary passages still exists, because in reality the correctness of this view has long since been refuted, both clinically and experimentally. From a clinical point of view it was Mikulicz's report in 1898 which drove the nail home. Mikulicz, on account of the somewhat frequent occurrence of postoperative pneumonia, had deserted ether and taken up chloroform, in the belief that the pneumonia was due to the irritating effect of ether. To his surprise, however, it appeared that the cases of chloroform narcosis were followed by a still greater percentage of postoperative pneumonia. He therefore decided to give up narcosis by inhalation entirely, and thereafter employed local anesthesia in all operations, even the major ones. But, to his yet greater surprise, the result was that the lung complications, far from decreasing, increased to a considerable extent: with 114 laparotomies he had no less than twenty-seven lung complications. Naturally, this experience overthrew the old conception that postoperative cases of pneumonia were 'narcosis pneumonia.' One curious fact should long ago have aroused the surgeon's suspicions, namely, that almost every 'narcosis pneumonia' manifested itself after laparotomy, while it is extremely rare to find pneumonia following operations on

the extremities, thorax, and head. To what was this strange occurrence due? Surely, in the main, to two circumstances: (1) That peritoneal infection is conveyed to the lungs partly by way of the lymph vessels and venous blood, and partly by embolism, and (2) that a patient with a laparotomy wound dares not cough or breathe freely, inasmuch as this involves pain in the wound. If, therefore, the patient is already suffering from bronchitis, or if an infection of the lungs sets in, the development of pneumonia is greatly favored by the deficiency in expectoration and lung ventilation.

"It has been proved experimentally with animals—and I myself have substantiated the fact by experiments—that ether does, indeed, occasion increased salivation in the salivary glands of the mouth, but that the air-passages (larynx, trachea, and bronchi) are not irritated at all, even when the animals are killed by administering ether through a tracheotomy tube until they are dead. Therefore, the only way in which ether narcosis *per se* can cause pneumonia is by aspiration of accumulated saliva in the throat. This, however, is always due to some technical error in the narcosis, for saliva should not be allowed to accumulate in the throat to any extent. . . . If, therefore, it is proved that ether fumes do not in any way irritate the main air-passages, one should admit that the other assertion must also be wrong. I mean the assertion that ether is contraindicated in patients suffering from lung disease: emphysema, bronchitis, bronchiectasis, abscess of the lung, etc."

Baldwin has had ether administered in very many thousands of cases: years ago by use of the old-fashioned cone, then the Allis inhaler, and now for a number of years by some form of the drop method. He has never had a death on the table from its administration. He cannot recall a single death from postoperative pneumonia. He has had two or perhaps three deaths from suppression of the urine. It is possible, perhaps probable, that this suppression was the result of the action of the ether on the kidneys, and yet we all know that deaths from suppression occur in cases in which no anesthetic whatever has been given.

Nitrous-oxide-oxygen has a field of usefulness to which it should be strictly limited. It can be used for very brief operations, as it has been for many years in the extraction of teeth. It is also probably the safest anesthetic to use, as suggested by Ochsner, in cases of acute pulmonary congestion, or of acute nephritis. With these exceptions, which make its field a very limited one, nitrous-oxide-oxygen should be looked upon as the most dangerous anesthetic that can be used, even in the hands of the most experienced.

THE NECESSITY FOR PROLONGED TREATMENT IN CASES OF INFANTILE PARALYSIS.

HERNAMAN-JOHNSON in the *Lancet* of July 29, 1916, states that the therapeutic lessons which have been learned in connection with infantile paralysis are of special interest at the present time, as the rules to be followed are for the most part equally applicable in dealing with war injuries to nerves and muscles. The three following, at least, should always be kept in mind:

1. A muscle which is chronically overstretched cannot recover. It must be relaxed by means of a suitable splint. This principle was insisted on by Robert Jones many years ago, and its importance cannot be overemphasized.

2. When such a muscle responds moderately well to faradism—or, in more modern terms, to the small or medium capacities of the Lewis Jones instrument—its recovery will be greatly hastened (and in some cases even determined) by daily rhythmical electrical stimulation. The relaxed position must, however, be maintained throughout.

3. Exercise, whether voluntary or electrically provoked, must never be carried to the point of fatigue. The contraction of a muscle should not be less vigorous—with the same stimulus—at the end of a sitting than at its commencement. It is better that recovery should be delayed by overcaution than that it should be made impossible by excess of zeal.

THE TREATMENT OF BURNS AFTER BATTLE.

In the *Lancet* of July 8, 1916, WAKELEY states the stages of burns are: (*a*) Stage of shock; (*b*) stage of sloughing; (*c*) stage of separation of the slough; (*d*) stage of scarring. On receipt of a case of burns the immediate treatment is obviously to treat shock. Treatment can be summed up briefly —rest, warmth, and morphine; local treatment as for any other septic burn. Wakeley opens any blebs and applies picric acid; this is both antiseptic and anesthetic. If possible, instead of this he immerses the patient in a warm saline bath, especially if the body is affected. If shock is very marked, he gives a continuous saline injection with a small amount of adrenalin in it. Injection of posterior lobe of pituitary body or ergot is equally good, but acts for a short time only; strychnine and alcohol he avoids. If picric acid has been used, this is left on until shock has completely passed off. Now immediate treatment must give place to expectant treatment.

Speaking of expectant treatment naturally proposes the question, What are the complications? In the first stage shock is the all-important factor; this he has already fully dealt with. In the second stage we have to treat sepsis and prevent internal complications, such as bronchitis, diarrhea and vomiting, duodenal ulcer, etc. In the treatment of sepsis Wakeley uses chiefly hypertonic saline solution for burns of the extremities, if possible as a bath, as this serves the double purpose of keeping away air and cleansing the wound. To the face, if it is impossible to apply a continuous saline douche so as to cover completely the whole surface, he uses an oil consisting of menthol, 2 grains; eucalyptus oil, 2 minims; carron oil to the ounce. He on no account employs a dressing; the oil is applied from a bowl kept at the bedside, from which it is carried to the face on cotton-wool. This is applied at frequent intervals, the eyes at the same time being irrigated with boric lotion. At least three or four times a day the face is slightly sponged with saline so as to remove any pus which may be present and the greater part of the oil. This insures that the oil is kept fresh and that no pus is allowed to be imprisoned under scabs, which quickly form if this precaution is not taken. If this is done frequently it is the simplest matter, and even the slightest hemorrhage is avoided; and above all any little islands of epithelium from which the new skin will be produced are preserved. Wakeley has found under this treatment that a burn that has been carefully examined and found to be, say, of the third degree, will be no deeper when examined four or five days later.

He does not claim that this treatment is easy and quick; on the contrary, it requires much patience and time, but the results amply repay one. At the end of seven to ten days the wound is usually quite clean, and the epithelium is very actively growing over the granulating surface. At this stage scarlet R. ointment may be used with benefit. By this method Wakeley finds that he never gets the hemorrhage in the third or "suppurating stage," and the fourth or "scarring stage" is seldom seen with burns of the depth of those caused by shell explosion or by the flash of cordite, which have been the cause of all the burns Wakeley has had to treat. Moreover, the frequent removal of all the products of inflammation prevents the absorption of toxin or toxins, whatever it may be that causes the internal complications mentioned above. It is thus that his treatment is both immediate and expectant.

THE TREATMENT OF TUBERCULOSIS WITH CYANOCUPROL.

In the *Journal of Experimental Medicine* of August 1, 1916, OTANI states that cyanocuprol is markedly effective in tuberculosis, and he believes that it will play an important part in clinical medicine. It may be used more generally than tuberculin.

The amount of the dose is closely related to the reaction and the final results. It should be determined for each patient after a careful examination of his symptoms. The maximum dose of 8.5 Cc. should in no

case be exceeded. The shortest interval between injections should be two weeks. If the drug is given after a shorter interval no improvement is observed and the effects are sometimes dangerous.

In order to obtain the best results the patient should be placed under conditions of complete physical and mental rest after the injection; this applies even to light cases. Care should be taken to secure rest for the lesion.

During the period of the treatment irritants to the lesion, such as potassium iodide or tuberculin, should be avoided; apricot juice, guaiacol and its derivatives, and iodol are contraindicated.

No marked idiosyncrasy has been noted and no accumulative effects have been observed.

CHEMOTHERAPY OF TUBERCULOSIS.

KOGA, in the *Journal of Experimental Medicine* of August 1, 1916, reports cases treated by chemotherapy and states that a general review of the cases will, he thinks, indicate that cyanocuprol greatly improves or apparently cures pulmonary and surgical tuberculosis in the first and second stages, and that it seems also to produce beneficial effects upon the disease in the third stage. The duration of these beneficial effects is still to be established by more numerous trials and many years of observation.

The preparation must be given intravenously, and the doses must be increased or decreased according to the age and constitution of each patient. Moreover, it should be borne in mind that the pathological phenomena and constitution of each patient have much to do with the determination of the dose. The manner of action of the preparation is not yet entirely clear. But if it acts primarily upon the tissues which bear the tuberculous lesions and then indirectly against the germ, as Koga assumes at present, the activity which the tissues exert will have much to do with the efficacy of the preparation. If this hypothesis is correct, the minimum doses (10 to 12 mg.) will be best suited to a patient who is greatly emaciated, and should be gradually increased as the reactions, pathological processes, nutrition, etc., indicate. In any case, the dose of the preparation must be determined by the condition and constitution of the patient. In animal experiments Koga has been fortunate enough to obtain results which no other preparation has given. The clinical application and the establishment of its full efficacy in human cases must be left to the physician.

THE VALUE OF SCARLET RED IN THE TREATMENT OF GASTRIC AND DUODENAL ULCER.

In the *Medical Record* of July 22, 1916, FRIEDENWALD and LEITZ state that scarlet red may be administered in doses of from 15 to 20 grains, three or four times daily, without producing the slightest toxic effect, provided a pure preparation be employed. It is best given in 7½-grain cachets, two of which may be taken three or four times daily before meals. It may, however, be administered in much larger doses, and only after very large continuous doses can the odor of camphor be detected in the urine. Not the slightest toxic effect of this drug could be observed in any instance during its employment in over one hundred patients.

They report the results of treatment of thirty-seven cases of ulcer in which scarlet red was employed in the course of treatment. In the largest proportion of these cases a most beneficial effect seems to have been obtained from its use. From the use of the remedy the following conclusions were drawn:

1. Scarlet red is a useful adjuvant in the treatment of peptic ulcer.

2. While it cannot replace the usual forms of treatment, when it is administered in conjunction with them it frequently renders the cure more effective.

3. As a help in the treatment of ambulatory cases it is of great service, and its effect seems to be even more favorable than that obtained from bismuth.

4. Its use need not in any way interfere with the administration of other remedies, such as alkalies or belladonna, when indi-

cated, and, in fact, the effect of the combination is at times most beneficial.

The use of this remedy has been noted by other observers. Zeublin found it of value in a case of gastric ulcer with hemorrhage. Einhorn points out its use in gastric and duodenal ulcer, and Jones has employed it along with the duodenal tube feeding, a daily dose of scarlet red in capsule being given by mouth, along the side of the tube, with apparent good results.

Friedenwald and Leitz have since employed this remedy in forty-five more cases of ulcer with equally favorable results. As in the last report they have not included those cases in which the Leube or Lenhartz cure had been undertaken and which have made uneventful recoveries, inasmuch as most of such cases would have recovered without the help of any drug whatsoever; but have included only those in which the result of the rest cure was unsatisfactory, and have added the ambulatory cases of ulcer, which remained unbenefited by the usual treatment.

Of those cases in which the remedy was employed sixteen were treated by the Leube rest cure, eighteen by the Lenhartz treatment, and eleven were ambulatory cases. Of those treated by the Leube cure, thirteen, or 28.8 per cent, were cured; two, or 4.4 per cent, were relieved; and one, or 2.2 per cent, was not relieved. Of those treated by the Lenhartz method, fourteen, or 31.1 per cent, were cured; two, or 4.4 per cent, were relieved; and two, or 4.4 per cent, were not relieved. Of those given ambulatory treatment, four, or 8.8 per cent, were cured; four, or 8.8 per cent, were relieved; and three, or 6.6 per cent, were not cured.

When we consider the fact that all of these cases resisted the usual treatment (that is, were treated by the usual methods first and were not relieved until the scarlet red had been administered), the results obtained are most encouraging, and are much like those noted in the authors' first report.

From their experience with this remedy in the treatment of the forty-five cases of peptic ulcer just noted, together with the results in the thirty-seven cases already reported, they believe they are justified in drawing the following conclusions:

1. Scarlet red still remains a useful adjuvant in the treatment of peptic ulcer, and while it cannot by any means replace the usual forms of treatment, when administered in conjunction with them it adds materially to the effectiveness of the cure.

2. It is of great help when administered in the ambulatory cases, the effect being even more favorable than the usual remedies, such as bismuth.

3. Inasmuch as scarlet red in no way interferes with the administration of other remedies, such as the alkalies or atropine, these may be administered when indicated at the same time, and, in fact, the effect of the combination is at times most beneficial.

EPILEPSY.

In the *Journal of the American Medical Association* of July 22, 1916, DERCUM states that the first indication is that the organism, though defective and deviatory, shall lead as physiologic a life as is compatible with its structure. To attain this end, a life without physical or mental strain, close to nature, in camp or on the farm, should be adopted by the epileptic. This, indeed, is the principle applied in the various epileptic colonies. In a given number of cases it is attended by an improvement in general health and a notable diminution in the number of seizures. There can be no doubt that the benefit is largely due to the increased oxidation of waste and toxic substances and the general increase of physiologic efficiency which result from an outdoor life. In addition, three points should be borne in mind:

1. The diet should be so modified that in this organism, already toxic, as little strain as possible be placed on the liver, the thyroid, and other defensive glands. For this reason the red meats are to be partaken of sparingly. The carbohydrates also are to be diminished. To take the latter in large amount is to hamper the oxidation of the tissues, an oxidation which for the obvious reason of the autotoxicity of the patient

should be maintained at as high a level as possible. In the diet, emphasis should be laid on the white meats, the succulent vegetables, and milk; eggs also may be permitted. Stimulants of all kinds are, of course, to be excluded.

2. The various avenues of elimination should be kept freely open. If the diet does not of itself counteract the constipation frequently present, a moderate dose of a simple saline or laxative water may be given daily. The patient should drink water freely between meals to promote the action of the kidneys, and should take a lukewarm sponge bath daily to promote the action of the skin. The bath should not be such as to promote an active reaction, but merely to favor elimination.

3. Resort to medicines must, of course, be had in many cases to influence or control the seizures. Space will not permit the extended discussion of these, but after all is said and done, experience teaches that chief reliance must be placed on the bromides. Regarding their efficient administration, however, one important point must be borne in mind, namely, the principle of sodium chloride withdrawal introduced by Richet and Toulouse. If table salt is withheld, the bromides instead of being eliminated are retained and are effective in much smaller dose. Dercum, himself, has been in the habit for many years past of administering the bromides in the form of sodium bromide, at the same time instituting as rigid a withdrawal of the sodium chloride as possible. There can be no doubt that under these circumstances the sodium bromide takes the place, in a measure, of the sodium chloride in the tissues. If, in a case so treated, the sodium bromide be discontinued and sodium chloride resumed, the bromide is rapidly eliminated in the urine.

But one other point of importance remains. In a given number of instances the physiologic level of the patient may be distinctly raised by the administration from time to time of small doses of thyroid extract; say from an eighth to a quarter of a grain three times daily, seldom more. Thyroid in small doses, long continued, stimulates the chain of glands of internal secretion, increases oxidation, and promotes metabolism generally.

TREATMENT OF UNSTABLE SEMILUNAR CARTILAGES OF THE KNEE-JOINT.

WHITMAN in the *Medical Record* of July 22, 1916, points out that displacement of the internal cartilage is usually caused by external rotation of the tibia on the femur, or by internal rotation of the femur upon the fixed tibia while the knee is flexed. The sudden strain upon the internal lateral ligament, whose deeper layer is attached to the cartilage, tears the latter loose from the margin of the tibia and displaces its anterolateral portion backward toward the interior of the joint, so that it is caught between the bones when the limb is extended. The general impression seems to be that the displacement is in the other direction, and that the cartilage projects beyond the margin of the tibia, where it may be detected on palpation. This, however, must be very unusual.

In typical cases the injury occurs during violent exercise, as in athletic contests. Thus in England it is known as "footballer's knee." There is a sensation of sudden strain, and often of something slipping within the joint, usually severe pain and immediate disability, the characteristic symptom being inability to extend the limb completely. Replacement may be spontaneous, but manipulation is usually necessary. An effective method is to place the patient on the back, and to flex the knee on the thigh and the thigh on the trunk. One then abducts the tibia on the femur to separate their inner margins, then rotates the tibia outward and inward and extends the limb. During the manipulation the patient usually feels something slip, and free motion is regained. Effusion often follows the accident, and sensitiveness about the inner side of the joint persists for several weeks.

The immediate treatment after reduction should be fixation for a time sufficient for the repair of the strained or ruptured liga-

ment and reattachment of the cartilage to the tibial margin. Apparently for want of treatment, or in spite of it, such security is not often established, since recurrence is the rule under predisposing conditions. If it occurs at infrequent intervals the reaction is usually severe. If it occurs often the joint becomes more tolerant, the patient learns some effective method of readjustment, or there may be no so-called locking of the joint, the disability being rather from a sense of insecurity than from the direct consequence of the displacement. This insecurity limits activity, not only in athletic contests but under ordinary conditions as well. The patient instinctively avoids predisposing attitudes and movements, and usually knee-caps, bandages, and even apparatus are worn to assure security.

The injury is most common in young men, but it is by no means rare in young women, and although the immediate cause is injury, weak feet, weak muscles, and bad attitudes must be recognized more often as predisposing factors in this sex.

Occasionally, the consequences are more serious, when, for example, the cartilage remains displaced, so that limited motion, pain, and synovitis persist indefinitely. In these cases partial recovery is explained by disintegration of the obstruction or accommodation to its presence. In other instances the cartilage may be broken or crushed by direct violence without actual displacement, and there are others in which injury or displacement is a complication of degenerative changes in the joint.

This paper is chiefly concerned with the ordinary cases in which the symptoms are recurrent, and are directly dependent on the displacement. In this class, although complete restoration of the function of the cartilage may be possible, it is probably uncommon, the so-called cure being in most instances simply an accommodation to the weakness.

A sense of insecurity is in itself a serious handicap, while recurrent displacement endangers the function of the joint. Repeated injury to the synovial membrane which covers the cartilage leads to hypertrophy; effusion to weakness; distention to laxity of the ligaments; and the secondary muscular atrophy which is almost always present increases the functional disability. In cases of the more serious type, changes characteristic of chronic arthritis follow, which may serve as a predisposing cause of tuberculous disease.

In cases, therefore, of persistent instability, in which the inconvenience is at all serious, particularly if a bandage or other support must be worn constantly, removal of the cartilage is indicated.

The operation would be advisable even if the cartilage were essential to normal function, since if it is loose it is practically a foreign body. It is not, however, thus essential. Experimentally, its removal does not affect the movements of the joint, nor is function impaired in those cases that have been operated on.

It is true that stability may be assured in most instances by a brace that prevents lateral mobility, but the treatment is somewhat burdensome, the outcome uncertain, and, if successful, the result no better than that which is practically assured by the removal of the unstable cartilage.

What may be classed as relatively early operative treatment is, Whitman finds, not usually advised or approved either by physicians or surgeons. The operation is thought to be dangerous, requiring prolonged convalescence, and resulting in a weakened or possibly stiffened joint. From practical experience, however, it may be stated that the immediate discomfort and the succeeding disability are usually no greater, and often are less, than when caused by the occasional displacement. In fact, functional recovery is far more often delayed by relaxed ligaments, atrophied muscles, and hypertrophied synovial membrane—the results of persistent irritation and injury—than by the operative removal of the cause.

The only reasonable argument for delay when the diagnosis is clear and the disability recurrent is the danger of infection, and this may be reduced to the most remote possibility by the simplicity and directness

of the operative procedure. In favorable cases the cartilage may be removed in a few minutes. There is no necessity for exploration of the joint, and the only assistance required is for retraction of the tissues.

Particular attention is, of course, paid to cleanliness. If time permits the part may be shaved, washed, and protected by gauze for several days before the operation, when it is prepared with iodine in the usual manner. An Esmarch bandage is usually applied in order to avoid swabbing and the like. The patient is then drawn down to the edge of the table, so that the leg, flexed to a right angle at the knee, hangs dependent, as suggested by Jones. In this attitude an incision, slightly convex forward, is made midway between the border of the patella and the condyle, its base being just in front of the internal lateral ligament. The joint is then opened. In most instances the displacement of the cartilage is evident, since the tension on the capsule of the dependent leg draws it upward and away from the table. Not infrequently it is detached anteriorly and displaced backward. It may be fractured, or thickened and pedunculated, but in the ordinary case it is not greatly changed in shape. It may be normal in appearance or yellowish in color if the disability is of long standing. By extending the incision downward the cartilage may be divided into two parts; the anterior or free half is then easily detached by a slight pull with the forceps. The posterior part is attached to the capsule, and often to the tibia, and must be separated with the scissors. It is the rule, apparently, to cut away only the loose anterior portion, but Whitman has always removed the entire cartilage, and thus a possible cause of further trouble. In most instances the evidences of previous irritation and injury may be seen in congestion of the tissues, and particularly in the hypertrophy of the synovial membrane.

After removal of the cartilage the synovial membrane is closed with fine catgut, and the capsule and other tissues in layers with stronger sutures. No drainage is used. The knee is firmly bound with a gauze roller, and a light plaster splint holding the limb in slight flexion is applied. Apparently the bleeding after suturing is insignificant, since no inconvenience has been noted from this source. The plaster splint is of service in lessening the discomfort caused by sudden movements during the sensitive stage. The patient usually remains in the hospital for a week, though not necessarily in bed, activity being regulated by the sensations.

The plaster splint is retained for about two weeks, in order to permit of repair of the capsule. The knee is then strapped to replace the support, and to guard against strain.

The patient is instructed to cultivate an elastic gait in walking. If, as is often the case, there is a tendency toward valgus, the soles are thickened on the inner border, or arch supports are applied if the deformity is more marked, and appropriate exercises are prescribed.

In cases of a favorable type cure is practically complete in a few weeks. In those of long standing, in which the muscles are atrophied, the ligaments relaxed, and the internal structure of the joint disorganized, recovery is slower, and a supporting apparatus may be indicated, but the improvement is immediately apparent and progressive and the result is satisfactory to the patient.

INDUSTRIAL ANILINE POISONING.

The *Lancet* of July 15, 1916, tells us that apart from the production of aniline colors, aniline is used in America in the compounding of rubber, especially for tires, and in reclaiming rubber from scrap. When the war suddenly shut off the supply from Germany rubber manufacturers began to manufacture aniline, so that now to the man exposed to anilism in rubber manufacture must be added those engaged in producing the aniline. Industrial aniline poisoning, which a few years ago was negligible, has suddenly assumed importance.

So far the making of dyes is too new in the United States to furnish cases; those reported come from the rubber industry and from the use of a wash for printers'

ink which contains aniline. The victims are known as "blue boys," from the cyanosis which is so prominent a symptom. Since the discovery of the cause of the trouble the rubber manufacturers have taken measures of protection, either by installing exhaust ventilators or simply by warning the men to seek the open air as soon as flushing of the face and violent headache come on. Pure aniline has never been known to cause poisoning; but pure aniline is not used in industry. What is known under this name is a mixture of aniline (amidobenzene) with metatoluidin, paratoluidin, or orthotoluidin, and xylidin in varying proportions.

Unlike most volatile poisons, aniline gives no warning, for it does not irritate the eyes and throat. Yet according to the researches of Lehmann, aniline is toxic in even smaller doses than benzene, chloroform, or carbon disulphide. Most of the industrial cases follow spilling or splashing of aniline over clothes or skin, and doubtless both skin absorption and lung absorption play their part. Rambousek places aniline and all the nitro and amido derivatives of the aromatic series among the blood poisons, the principal action of which is to cause the formation of methemoglobin, in which the oxygen is firmly bound, thus producing a condition of "internal suffocation."

In England Dr. W. Malden has examined the blood of men employed in the manufacture of aniline dyes and nitrobenzene. In about half he found a high red count with a low color index and many imperfectly developed red corpuscles. The spectrum of methemoglobin could be detected only when it was present in the proportion of 1 part to 10 of oxyhemoglobin. Loss of hemoglobin ran from 5 to 50 per cent. Stained specimens showed great variations in the size of the red corpuscles. Basophilic granules were found. Dr. Malden believes that this is often the earliest sign of aniline poisoning, as it is of lead poisoning. The first symptoms are weariness or sleepiness, flushing of the face, a sense of fulness in the head, and even of slight mental confusion, dryness of the throat, and dysphagia. The color of the face changes from red to livid blue, which may increase to a deep purple. The pulse is rapid and weak, the temperature subnormal. Headache comes on early and is often violent, accompanied by dizziness and nausea, and in the more serious cases there is decided dyspnea, increasing mental confusion, and finally loss of consciousness. These symptoms are due to want of oxygen. Later symptoms—icterus, methemoglobinuria, bladder irritation, and bronchitis—are caused by the elimination of the poison. In some cases the subjective symptoms are slight, and the man seeks advice because of his livid or blue color, which is alarming to him and his friends. Usually industrial cases do not exhibit the severest symptoms, but epileptoid convulsions and protracted coma have occurred and proved puzzling to the medical attendant.

Recovery in the milder cases is prompt, the men usually returning to work on the following day, though the cyanosis often persists for several days more. Chronic anilism is described by von Jaksch as a condition resulting from repeated doses of the poison so small as not to set up symptoms of acute poisoning. There is more or less headache, nausea, vertigo, muscular twitchings, disturbances of vision, sense of exhaustion, and loss of strength. The skin is usually livid, or it may be jaundiced. In one case the man was treated for heart disease because of his cyanotic appearance and dyspnea on exertion.

CONTRAINDICATIONS IN THE PNEUMOTHORAX TREATMENT OF PULMONARY TUBERCLE.

RIVIERE in the *Lancet* of July 15, 1916, states that disease of other organs, whether tubercular or not, may contraindicate the production of an artificial pneumothorax.

Advanced emphysema and asthma are contraindications. Dyspnea is in itself no contraindication, since it is in many cases toxic in origin and is relieved by the removal of autoinoculation.

Pneumothorax therapy may reduce the pulmonary vascular area, in some cases at least, and thus put a strain on the right heart. In addition, the loss or reduction of intrathoracic suction tends to embarrass the venous circulation. The effect of these disabilities on circulatory organs and kidneys renders any serious disease of these organs a contraindication to pneumothorax therapy. On the other hand, it must be noted that certain cases of nephritis appear to be of tuberculotoxic origin, and have been known to recover when autoinoculation was removed.

Laryngeal tuberculosis is no contraindication, unless very advanced, and then a doubtful one. Da Gradi has described three bad cases from Forlanini's clinic improved or healed. Slighter cases of laryngeal disease commonly improve; among 11 such cases mentioned by Zink all recovered except one very bad one, and that one improved very decidedly.

Intestinal tuberculosis is a contraindication, unless slight and consequently latent. Brauer and Spengler, however, record two cases in which intestinal disease led to symptoms, and in which these disappeared under pneumothorax treatment.

Diabetes is a complication which should make the physician very chary of recommending pneumothorax treatment.

In conclusion it may be stated briefly that pneumothorax should be borne in mind in all cases in which life is "threatened," but it must not be postponed till life is "in danger," for it is mostly then too late. "The higher function of pneumothorax therapy," says Weiss, "is this—to restore lost cases to health;" but the bad outlook must be recognized in good time if pneumothorax treatment is to succeed. A phthisis case may be to the initiated "lost," so far as ordinary methods of treatment are of avail, long before the end is in sight. It is at this stage, or even before, that the suitability of pneumothorax treatment must be decided upon if a clear other lung, absence of widespread adhesions, and a reëxpansible lung are to be with any likelihood attained. On the other hand, it must be admitted that the advanced, apparently unilateral, hilus tuberculosis cases are seldom met too late for this treatment, and it is remarkable how often the pleura remains sufficiently unadherent to allow the production of an efficient pneumothorax over disease extending even from apex to base.

THE SIGNIFICANCE OF THE AMINO-ACIDS.

The *Lancet* of July 8, 1916, points out that the interesting group of bodies known as the amino-acids is disclosing facts of the utmost importance in connection with nutrition. It is well known that on hydrolysis proteins break down by resolution of the polypeptide linkings in the molecule into an assembly of *a*-amino-acids, of which some 18 have been separated. Inquiry is now being developed in directions which show that each of these substances possesses its own significance—sometimes greater, sometimes less—in the processes of nutrition. Inasmuch as the proteins do not all alike resolve into the same amino-acids, it is clear that their metabolic value will depend upon the kind of amino-acid produced.

In an interesting and lucid lecture upon the subject delivered before the Chemical Society on May 18 by Dr. F. Gowland Hopkins, and now published in the June number of the society's journal, these "newer standpoints in the study of nutrition"—the title of the lecture—are carefully discussed. The starting-point of this study is that when a mixture of all the free amino-acids obtainable from protein has entirely replaced the normal intact protein of their food, an adult animal maintains itself and a young animal grows. In his own experience Dr. Hopkins records that scores of young animals grow steadily during experimental periods when no trace of intact protein, and no other source of flesh-forming material save amino-acids, was passing their mouths.

In a brief and excellent outline of the salient features of the problem Dr. Frank P. Underhill, professor of pathological chemistry, Yale University, makes similar observations. His conclusion is that the

amino-acids must be regarded as foodstuffs capable of supplying the nitrogenous needs of the organism, and that the chief factors to be taken into account with regard to the nutritive value of any protein or proteins are the character and the extent of the amino-acids contained therein. Since it is mainly, if not entirely, in the form of free amino-acids, and not in complex associations of these, that our nitrogenous food begins its proper metabolism, it is obviously valuable to be able to measure the relative nutritive importance of the different molecular groups in the protein molecule. We could then determine, as Dr. Hopkins points out, whether in any particular case the withdrawal of individual amino-acids deprives the animal of something essential, or whether, perhaps, the removal from the food of any particular amino-acid under study may have little effect, because the animal can synthesize it for itself or dispense with it altogether. We may thus gain a further insight into the question of deficiency diseases. It should be pointed out, however, that during the use of the synthetic diets suggested as a basis of inquiry, Dr. Hopkins has found that it is always essential to supply the "at present mysterious vitamine of food hormone factor."

The results of the experiments are very remarkable. Thus when an animal is fed on food containing only tryptophan, histidine, tyrosine, lysine, and cystine—that is, five out of the eighteen amino-acids of protein—there is a remarkably slow loss of weight, and long maintenance of apparent health. On the other hand, when the five amino-acids mentioned are replaced by another five of simpler aliphatic type, when leucine, valine, alanine, and glycine, together with glutamic acid, form the sole nitrogen supply, loss of weight is rapid and the animal soon succumbs. A familiar case of a non-nutritional protein is gelatin, and, significantly enough, this substance on hydrolysis yields neither tyrosine nor tryptophan. The entire absence of tryptophan from its molecule stamps it at once, says Dr. Hopkins, as a deficient foodstuff. Dr. Hopkins goes even so far as to say that he feels it quite possible that further experiment will show that life can be maintained on a mixture from which many of the amino-acids are lacking. This suggests that if nutrition can be guaranteed on a quite limited number of amino-acids, the solution of the problem of artificially synthesizing our food-supply is brought within the region of possibility. On all fours with this are the independent conclusions of Professor Underhill in the work already referred to. Investigations of this character promise ultimately, he suggests, to lead to the assignment of more or less specific functions to the various amino-acids, and hence will indirectly indicate the relative efficiency of this or that protein in bringing about a desired result in nutrition. The whole story is a triumph of biochemical research.

TUBAL STERILIZATION.

HEINEBERG in the *New York Medical Journal* of July 15, 1916, contributes a useful paper on this subject. From his résumé of the clinical and experimental experience with tubal sterilization, he believes that we may fairly arrive at the following conclusions:

1. There is no method of tubal sterilization which affords absolute security against conception.

2. Simple ligation of Fallopian tubes with either single or double ligatures has been followed by the largest number of reported failures.

3. Excision of a wedge-shaped section from each cornu of the uterus, followed by careful closure of the opening with musculomuscular and seroserous sutures, has yielded better results than any other method.

4. In the light of our present knowledge it seems unwise to advocate any other method than cornual resection. These conclusions are in accord with those arrived at in previous reviews of this subject by Charles, Geissler, Günther, Mironow, Offergeld, Perdrizet, Pestalozza, and Sarwey.

EXPERIENCE WITH HOMOGENIZED OLIVE OIL MIXTURES.

LADD in the *Archives of Pediatrics* for July, 1916, states that the principal differences in the fats of cow's milk and human milk are the size of the fat globules and the proportion of volatile fatty acids. The proportion of volatile fatty acids in breast milk is 2.5 per cent of the total fat; in cow's milk 27.0 per cent of the total fat. The non-volatile fats are made up mostly of olein and palmitin in both cow's milk and breast milk. Olive oil is almost wholly olein and palmitin, and free from the volatile fatty acids which form such a large proportion of cow's milk fat. It was Ladd's suggestion, therefore, to utilize olive oil to obtain the fat percentage in modified milk mixtures and so to eliminate the volatile fatty acids; and also by homogenization to secure an emulsion as fine or finer than that of human milk. The milk-sugar and proteins were to be obtained from skimmed milk as usual, and additional carbohydrates, in the form of dextri-maltose and starch, prescribed according to the usual indications.

This method of feeding has been applied to 37 cases, of which 12 occurred in private practice and 25 in the out-patient department of the Children's Hospital. The present series includes the subsequent histories of the cases reported last year. Ladd has not included in this list the older children, whose diet was from the start a mixed one, and which would, therefore, come into another class. He has also excluded one private case of congenital heart disease and enlarged thymus, two or three hospital cases which had the milk for a few days only, and a few which have been recently started. The series as tabulated includes practically all of the cases of difficult feeding that he has had an opportunity to study.

It should be borne in mind that the hospital cases which he has used were babies which had been under treatment for malnutrition and indigestion for considerable periods without making satisfactory progress in their weight development under the usual methods of feeding. The average length of this period of out-patient feeding in this series, before beginning the homogenized olive oil mixtures, was three months. The result of previous feedings is best appreciated when one understands that the average number of months was 6.3, with an average gain of only 5 ounces per month.

Naturally in such a series all types and degrees of indigestion were met with. It is not difficult to modify milk in such a way that fairly normal movements and freedom from discomfort are obtained, but the failure of the feeding is shown by the lack of normal weight development—and by digestive disturbances brought about when the attempt is made to raise the fats to such a point that normal gains in weight should be expected.

A normal, healthy baby gains, according to a high standard of growth, 14 pounds in twelve months, or an average of 18.7 ounces per month.

In Ladd's series of 37 cases, whose average gain on previous feedings was 5 ounces per month, for a period of 6.3 months, the average gain per month was 18.15 ounces, or within one-half ounce per month of the normal healthy infant. This represents a gain of three and one-half times (363 per cent) over that of the previous feeding. The average period of the homogenized olive oil feeding was 4.7 months, a sufficient time to determine its permanent effects.

The improvement in the babies' general condition has been as striking as that of their gain in weight. Vomiting and sour regurgitation, when present as symptoms, are quickly relieved. The child improves in strength, in the quality of its fat, and in the development of its functions, as one expects it to do in normal successful feeding. The appetite improves rapidly, and the stools soon become normal in appearance, if the sugars are intelligently prescribed. By this he refers to proper proportions of dextrin and maltose. When there is a tendency to looseness, he has used the preparation known as "dextri-maltose" for the extra carbohydrates; on the other hand, when the bowels are constipated, the

usual laboratory "maltose," or malt soup preparations, are preferable. In many cases a combination of the two will bring about a normal stool if used in proportions suited to the individual child. Barley water (0.75 per cent) was used in nearly every case. In some cases the mixture was treated to 212° F., in others given unheated. Lime water was usually given in amounts of 5 to 10 per cent of the total mixture, but not as a matter of routine.

The percentage of olive oil was almost invariably started at 1.50 and did not exceed 3.50 per cent. The indication for raising this was the rate of gain and sense of hunger. The total carbohydrate was usually started at about 5 per cent and never exceeded 7 per cent. The proteins were started at 1.50 per cent and seldom exceeded 2 per cent. In Ladd's opinion hunger is the safest guide as to the child's tolerance for the amount of fat it is taking. If the appetite remains keen, the olive oil is being well taken care of.

CREOLIN IN SCABIES IN THE INFANT.

In the *Archives of Pediatrics* for July, 1916, MONTGOMERY says his first acquaintance with the good qualities of creolin came about almost by accident. Some years ago, while passing through Dresden, he called on J. Werther, who invited Montgomery to see his clinic in the city hospital. While viewing a patient with scabies, Dr. Werther rather pointedly remarked that creolin was of decided value in this disease, and on Montgomery's further inquiry Werther gave him the following prescription:

℞ Creolin, 10.00;
Sapo. viridis, 30.00;
Adipis benzoati, q. s. ad. 100.00.
M. Sig.: Rub in once a day.

The green soap adds to the penetrating qualities of the preparation, but it is not a necessary ingredient, and may be undesirable as drying and irritating to the tender infant skin.

Creolin owes its effectiveness to the presence of trikresol. These three cresols are the isomeric methylated benzine alcohols that occur associated with phenol in coal tar and in creosote. In fact, the name cresol is an abbreviation of creos-ol, meaning the alcohol of creosote. The cresols are very widely distributed in nature. Two of them, para- and ortho-methylated oxybenzol, occur in the urine. It is doubtful if meta-cresol has ever been found there. The three cresols, ortho-, meta-, and para-cresol, are by no means of equal value as antiseptics, as meta-cresol is by far more powerful than either of the other two. Pure trikresol is a clear, oily liquid, soluble in water to the extent of 2 per cent, and very slowly diffusible. If, for instance, pure trikresol is dropped into water it instantly sinks to the bottom of the glass, where it rests as a beautiful, clear, egg-shaped mass. The preparation called creolin, however, when dropped into water quickly diffuses, making a milky mixture, which may be highly diluted and yet retain its insecticidal quality. It is this that renders creolin so cheap in the commercial uses to which it is put in destroying mosquito larvæ and the insects that infest chicken-coops.

PREGNANCY TOXEMIA.

WILLIAMSON in *American Medicine* for June, 1916, reaches these conclusions:

1. In cases of pregnancy toxemia chloroform should never be administered, because the action of chloroform is to render more grave the lesions which already exist and increase the acidosis. Ether administered by the open method is in every way preferable as an anesthetic.

2. Calomel should not be used as an aperient, for the lesions in the liver and kidneys produced by mercurial poisoning are of the same nature as those of pregnancy toxemia, and it is probable that mercury even in small doses will increase the gravity of the lesions already existing.

3. For a similar reason douches of mercurial antiseptics should never be employed.

4. In all cases in which acidosis is pres-

ent intravenous infusion with a solution of sodium bicarbonate or sodium acetate should be practiced.

5. The fat metabolism should be spared as far as possible by the administration of glucose. Williamson's practice has been to administer it by the rectum when vomiting is present, and to give it by the mouth in the form of glucose lemonade where the digestive functions are not deranged.

6. When a pregnant woman suffering from chronic nephritis shows evidence of the existence of acidosis, the uterine contents should be evacuated without delay, for with kidneys previously damaged the prognosis of pregnancy toxemia is very grave.

THE TREATMENT OF PARALYSIS AGITANS WITH PARATHYROID GLAND.

In the *Medical Record* of July 15, 1916, BERKELEY states that further experience seems fully to justify the opinion he has formerly expressed, namely, that parathyroid gland is not a "cure" for paralysis agitans, but that 60 to 70 per cent of the sufferers from this dreadful disease who have given the remedy a fair trial for from three to six months (it takes all of this time to test it) have been greatly benefited, and that in such patients the progress of the disease has been arrested, or very materially retarded.

One patient, an elderly man, has taken the capsules for seven years (also the hypodermic solution at times), and he is still in fairly good condition, but lapses into helplessness within a few days when the medicine is omitted.

Another recent case, a woman, fifty-two years old, has done wonderfully well. Her agitation has been entirely arrested, and her rigidity greatly relieved. She had suffered with the disease for two years before Berkeley saw her, and had spent all of her money on osteopathic and electrical treatments; so that, if suggestion had anything to do with her case, she certainly had ample opportunity for full exercise of her imagination before undertaking the parathyroid medication.

There are no other internal secretions which have any specifically beneficial effect whatever—either alone or in combination—in paralysis agitans. Among the older patients pineal gland is a useful stimulant to functionally failing mental activity, and there is now on the market one extract of pancreas which is valuable in the peculiarly obstinate constipation these patients are afflicted with. But Berkeley cannot too strongly deprecate promiscuous dosing with thyroid, and pituitary, and others of the internal glands. Thyroid, especially, does serious harm; even massage of the neck over the thyroid gland sometimes liberates enough of the thyroid secretion to make the patient distinctly uncomfortable.

Like most chronic diseases, paralysis agitans does not do well in institutions, for reasons which are sufficiently obvious. The most successful cases have been in private practice, where cheerful surroundings, occasional opportunities for travel, and a varied diet contribute to the patient's comfort, and increase his resisting power. But a fair proportion even of the almshouse poor have been greatly helped.

Berkeley is still of the opinion, as he has long been, that paralysis agitans is caused by a deficiency of the parathyroid glands, and that further and more diligent study of the complicated chemical processes involved will make it ultimately possible to cure paralysis agitans with parathyroid in just the same way in which cretinism is cured with thyroid.

THE VALUE OF EUDRENINE IN MINOR OPERATIVE SURGERY.

In *The Prescriber* of Edinburgh for July, 1916, ALLAN reminds us that the administration of a general anesthetic is never quite devoid of danger, even in the hands of the most skilled anesthetist; and further, unpleasant after-effects cannot be altogether eliminated, although these can be reduced to a minimum by the careful preparation of the patient and by the skilled exhibition of the anesthetic employed, both during the induction of and during the

maintenance of anesthesia. While the majority of major operations necessitate the use of a general anesthetic, many minor surgical conditions can be operated on under local anesthesia. Allan has made use of many local anesthetics, and he would like to make a few remarks on eudrenine, which he has employed with very successful results. Eudrenine consists of benzamine (beta-eucaine) hydrochloride (one per cent), associated with adrenalin chloride (1 to 30,000), in physiological salt solution, and it is preserved with chloretone. Each Cc. (16.9 minims) contains benzamine hydrochloride (grain 1/6) and adrenalin chloride (grain 1/2000).

The technique is very similar to that of most other local anesthetics, and need not be detailed. It will suffice to say that the injection is made with an ordinary hypodermic syringe, and the solution is slowly injected into the area to be operated upon. This should of course be done with aseptic precautions, and so far as the patient is concerned, painting the operation area with iodine is generally all that is required. For the majority of small operations it is seldom necessary to inject more than 1 Cc., and in some cases a smaller quantity will suffice. If a larger area has to be anesthetized and more of the solution is required, it is advisable to dilute the solution with some normal saline, say 1 part of eudrenine to 3 or 4 parts of physiological sodium chloride solution. This tends to minimize the risk of toxic symptoms supervening or of untoward local effects resulting. Care should be taken to allow sufficient time to elapse before commencing the operation, otherwise the results may be disappointing. The time for the production of efficient anesthesia is not very long, and in the majority of cases varies from five to ten minutes. In addition to this excellent local anesthetic effect, the injection of eudrenine renders the area of the operation practically bloodless, and so greatly facilitates quick operative work. The effect, however, is not so transient that one need hurry over the operation, for Allan has found that where speedy operation was not possible the anesthetic action has been maintained for a considerable time. It would appear that the addition of adrenalin chloride to the beta-eucaine enhances and intensifies the local analgesic effect of the latter.

Allan says something regarding some of the cases in which he has employed it. In searching for portions of needles in the hand, etc., it is generally necessary to employ a local anesthetic, for those who have had experience of such cases know that the search may take some time, even when the foreign body has been located with the *x*-rays. In one case of this nature a search for a portion of needle in the hand was made before a radiograph had been taken, but without result. The hand was then photographed, the needle located, and after some little trouble it was extracted. The delay thus caused was considerable, and it was almost two hours after the injection before the needle was ultimately removed. Yet the anesthetic effect had evidently not passed off, and it was only when one cut into the deeper parts, to which the solution had probably not reached, that the patient complained of a little pain.

Another class of foreign bodies in the tissue, namely, bullets and pieces of shell, can be extracted under local anesthesia, provided these are not too deeply situated, and Allan has successfully dealt with several cases of this kind. In the removal of small tumors and cysts eudrenine is very useful, and of cases in this category in which he has employed it may be mentioned papilloma of the thigh, warty growth on ankle, sebaceous and dermoid cysts, lipoma of neck, nevus of arm, etc.

Eudrenine is also useful in ophthalmic work. The anesthetizing effect of cocaine instilled into the eye by drops is comparatively superficial, and in the case of squint operations, where one or other of the eye muscles has to be advanced, the injection of a little eudrenine or other solution into the deeper parts is necessary if the operation is to be carried out without pain. In various small plastic operations it may be utilized, and other conditions in the realms

of minor operative work will readily occur to one as cases in which this local anesthetic may be beneficially employed.

In Allan's experience eudrenine has proved to be a reliable local anesthetic. Its analgesic action has been almost perfect, and there has been very little bleeding (in some the operation area has been quite bloodless) in cases in which it has been used, two very important factors of recommendation for any local anesthetic. Allan has seen no toxic symptoms supervene after its use, and after-effects locally have been conspicuous by their absence. All his cases which were aseptic to start with have healed by primary union. Eudrenine is not nearly so effective in the presence of inflammatory trouble; indeed, in some of these cases it appears to have no effect at all. Apart from that it is a safe and reliable local anesthetic, and may be recommended with confidence for numerous cases such as he has indicated above. It is well to know that many small operations can be successfully performed under a local anesthetic without the help of a brother practitioner.

DIABETIC ACIDOSIS.

In *American Medicine* for June, 1916, CROFTAN states that the prevention of acidosis in the milder grades of diabetes is not a difficult problem, provided routine proteid-fat feeding is not adopted without control. With an amount of carbohydrate administered within the limits of established tolerance, together with sufficient fixed alkali in the form of soda bicarbonate to protect the tissue alkalies, acidosis can usually be prevented or held within safe bounds indefinitely, while at the same time the patient's general nutrition and strength can be comfortably maintained.

In the more severe types of diabetes, viz., that class in which carbohydrate tolerance, even for a single carbohydrate (oatmeal cures), is low or *nil* and in which some reduction of proteid must be practiced to cause a disappearance of the glycosuria, one can adopt one of two plans: either inaugurate a short starvation period, determine the tolerance of proteid and carbohydrate, permanently reduce the patient's weight, *i.e.*, total caloric requirements, carefully establish the fat effect, and then feed accordingly, with soda, thus keeping the patient undernourished but free from glycosuria and ketonuria; or, more practically, several recent writers of an academic bias, to the contrary notwithstanding, permit a mild glycosuria within controlled bounds by giving proteid and carbohydrate slightly above the established tolerance limits, with little fat, abundant soda and alcohol, thus maintaining in a much more adequate and, to the patient, more satisfactory and equally safe way nutrition, strength, and enjoyment of life.

Personally, Croftan cannot from his experience subscribe to the newer dictum that every diabetic should be kept permanently sugar-free, if necessary to accomplish this, thin, and, in any event, undernourished. If one could keep these patients permanently or, at least, for months in an institution this plan might be of advantage, but from the standpoint of the physician in actual practice, and from the standpoint of the vast majority of patients, the full nutrition plan, with controlled glycosuria, is more feasible and, above all things, more human.

In the very severe types of diabetes, and to this group belong most of the childhood and adolescent types, one is usually confronted with a desperate and, as far as the end result is concerned, a hopeless situation. Here no sacrifice is too great and the principle of rest to the deeply disordered metabolic function must be carried out to its utmost limit. Strict individualization as to tolerance is required. A short cut to these studies is the starvation plan. Instead of consuming weeks to practice slow proteid starvation, one can apparently arrive at the same goal more quickly and apparently as safely and without the use of soda by a fasting period, preferably preceded by a short term of proteid starvation. Personally, Croftan has learned to combine the starvation with the administration of pancreatized oatmeal by rectum as an equally rapid and less weakening process.

The effect of fasting on acidosis varies in these cases; the element of idiosyncrasy is pronounced, and it is important to individualize. One can never predict in advance just what will occur, so that this form of treatment, to render it safe, should remain an institution method, carried out under the most accurate control and with all emergency measures at hand. Croftan rather dreads the effect of the coma mortality and the popularization of this precarious method will have, when administered as a routine. Most alarming degrees of acidosis do unquestionably appear, and carbohydrate must occasionally be given to save life; if the patient survives, a second fasting attempt may be, and often is, more successful.

Croftan's experience so far has taught him that, even after taking the risk and imposing the sacrifice of a fasting course in very severe types of diabetes, the good immediate results, even in the most favorable cases, are not followed, after the patient is dismissed from personal observation and control, by end results materially better or more permanent than those obtained by the slower but safer and less irksome process of slow proteid starvation.

The subject of acidosis remains obscure, paradoxical, bizarre, uncertain. Newer methods may stabilize our conceptions and clear our understanding. That an acid intoxication can produce air hunger, Kussmaul breathing, vomiting, convulsions, delirium, and coma is established, but whether the fulminating picture of diabetic coma is always due to such an acidosis remains problematical. The metabolic derangement is so extreme, the degradation of the proteids and fats so abnormal, that any one of numberless intermediary products of catabolism, the existence of which we may not even suspect, might be incriminated with causing coma; Croftan has never been able to suppress the conviction that highly toxic products of proteid disintegration, still albuminoid in character, play a part. When we remember that the nearer the albuminoid degradation products approximate the original molecule the more toxic they remain, when we recall the supertoxic properties of toxalbumins, ptomatoxins, and of all that group, one is strongly tempted to postulate that, even in minute quantities, they can produce the tragic picture of coma.

ADRENALIN PER OS FOR ABDOMINAL PAIN.

Boogher (*New York Medical Journal*, July 8, 1916), having recently suffered with an abscess of the transverse colon, it was suggested to him, after twenty-four hours of excruciating pain, by Dr. George Richter, of St. Louis, that he try fifteen drops of adrenalin in one tablespoonful of water as often as required, for the relief of this pain.

Fearing to take morphine because of its muscular fixation powers and its after-effects, Boogher gladly welcomed the suggestion, as adrenalin had been used in Vienna in the surgical wards with splendid results, the patients themselves asking for the "good drops" on the approach of abdominal pain.

At the suggestion of Dr. C. A. L. Reed, of Cincinnati, Boogher told Dr. Andrews, chairman of the surgical section of the A. M. A.; he requested Boogher to take two minutes of the afternoon session which was held conjointly with the internal medical section at the Detroit meeting of the American Medical Association.

Boogher has suggested it in a gall-stone case and used it in kidney colic, in both of which cases it gave splendid relief.

He considers it a panacea in all cases of abdominal pain.

In fifteen-drop doses in a tablespoonful of water it can be given as often as required internally, its action being different when administered hypodermically.

He believes adrenalin could be used as a substitute for twilight sleep.

This letter is doubly interesting, first, on account of the announcement of the discovery of analgesic properties in adrenalin, and second, because the product has always been considered inert when administered per os. Even the manufacturers insist that suprarenal preparations must be given hypodermically in order to produce either a physiological or a therapeutic effect.

DANGER OF BATHS IN PATIENTS SUFFERING FROM ARTERIOSCLEROSIS.

In the *California State Journal of Medicine* for July, 1916, KERR states that most hydrotherapists have agreed that the changes in blood-pressure depend upon the temperature of the water much more than upon any action of the salts in solution, yet there cannot be any doubt that these have some influence, although our knowledge on this point goes very little beyond the general statement that the salts, especially the chlorides, by process of endosmosis, reach the upper layers of the cutis, to which they attract water from the deeper tissues. This abstraction of water stimulates the terminations of the cutaneous nerves, and, reflexly, the cardiac and vasomotor centers. There is no absorption of salts through the skin into the circulation. Much greater importance is attached to the presence of carbon dioxide. This has been worked out especially in relation to the Nauheim baths, and Mueller has found that in the artificial Nauheim baths, while the pressure depends more upon the temperature of the water than upon the carbon dioxide present, on the other hand these two factors participate almost equally in the production of changes in the pulse-rate.

At one time it was believed and taught that the carbon dioxide produced a prolonged dilatation of the peripheral vessels, and therefore a lowering of pressure and lightening of the heart's work. This, however, is erroneous, and it has been shown that in the cool Nauheim bath there is a rise in pressure due to contraction of the peripheral vessels which is not compensated by the splanchnic vessels, although these dilate to a considerable extent; that the ventricular output is increased, and that there is a greater and more rapid flow of blood through the peripheral vessels producing a pink color of the skin. As the pulse-rate is slowed the increased output must be due to a more complete systole diminishing the amount of residual blood usually remaining in the ventricle, for it must be remembered that normally the ventricle does not empty itself with each contraction, but that, in such animals as the dog, with a pulse-rate of 90, about one-third of the ventricular contents remains after each systole. The effect of the Nauheim baths is supposed to be due to the fact that carbon dioxide, accumulated on the body surface, retards the conduction of heat from the body to the water, and thus prevents the rapid cooling that takes place in plain water. In the carbon dioxide bath the peripheral nerves receive the usual stimulation from the application of cold, but the body temperature being longer maintained the result is as if the patient had a cold and warm bath simultaneously.

It is evident that the Nauheim bath by simultaneously contracting the peripheral vessels and increasing the cardiac output produces increased work for the heart, that the temperature and amount of carbon dioxide being capable of regulation, the amount of this work can be graduated to the heart's capabilities, and finally that the adaptability of cases to the treatment will depend on the responsive power of the myocardium, rather than on the nature of the lesion. For the same reason it may be expected that such cases of arteriosclerosis, kidney involvement, or high blood-pressure as are deemed suitable to hydrotherapeutic measures will frequently do better in the saline baths at a temperature of 94° F. to 96° F., than in those containing carbon dioxide, and at either a higher or lower temperature.

In conclusion, the writer emphasizes the fact that warm baths may be dangerous to patients suffering from arteriosclerosis, because the higher temperature tends to increase the heart load by causing a slight rise in the systolic pressure but a marked fall in the diastolic, which together with the acceleration of the pulse-rate may result in serious augmentation of the strain upon the heart muscle.

In giving baths, therefore, the attendant must note the diastolic as well as the systolic pressure, and figure out the heart load, and not content himself by observing that the systolic pressure is not very much increased.

RECENT PROGRESS IN OUR KNOWLEDGE OF THE PHYSIOLOGICAL ACTION OF ATMOSPHERIC CONDITIONS.

This important subject is discussed by LEE in the *American Journal of Obstetrics* for July, 1916. He states that in the physiological laboratory of the Columbia School of Medicine, Dr. Eastman and he made experiments the results of which have changed their ideas concerning the physiological action of atmospheric conditions. It had long been the custom to ascribe to chemical components of the atmosphere the bad effects of living in air that had already been breathed by human beings. The discovery of oxygen and carbon dioxide early in the last century gave a great stimulus to this notion, and it became firmly fixed in the minds of chemists, physiologists, and physicians, as well as the educated masses, that air that had once been breathed was chemically vitiated and rendered unfit for human use by the lack of oxygen, the accumulation of carbon dioxide, and the presence of an organic poison of unknown nature. No sooner had this notion become widely accepted than the laboratories began to demonstrate the inadequacy of the supposed proof of the notion. To cut a long story short, it is now known that, except under very unusual circumstances, the harmfulness of respired air is not due to its chemical components. The harmfulness of living in confined air is found in certain physical rather than chemical features—the air is too warm, too moist, and too still; and if it has not these physical features it is not harmful. We all have sat in crowded assemblies, we all have experienced the hot, humid, still days of an American summer. We all know the effects of such air on our sensations.

In what respect is hot, humid, still air harmful? To answer this question we must consult the records of many researches, chiefly on human beings, but partly on animals, that have been undertaken since Hermane, more than thirty years ago, observed that in crowded theaters and churches his own bodily temperature rose. The most recent of these researches is that of the New York State Commission on Ventilation, which has been in progress for the past two and a half years and is not yet completed. Notwithstanding that man is supposed to be a homothermal organism, there is a certain relationship between his bodily temperature and the temperature of his environment, even under the ordinary conditions of living. This has been shown by the New York commission, which found that during the months of June and July the rectal temperature of its subjects at 8 A.M. living in their own homes, was conditioned by the average atmospheric temperature of the previous night. The variation of the bodily temperature was about 1° F. for 20° F. of atmospheric temperature, although it is probable that the degree of variation can be modified by the clothing. The commission further found that, whatever the bodily temperature of its subject might be, it was lowered by confinement in an atmosphere of 68° F. and 50 per cent relative humidity, and raised by confinement at 75° F. with the same humidity, or still more by 86° F. with 80 per cent humidity. The final average bodily temperatures in a certain series of observations, where the subjects were confined in the observation chamber for from four to seven hours, were:

68° F. (20.0° C.) 50% humidity.....98.0° F. (36.7° C.)
75° F. (23.9° C.) 50% humidity.....98.5° F. (36.9° C.)
86° F. (30.0° C.) 80% humidity.....99.3° F. (37.4° C.)

Haldane and others have shown a greater elevation of bodily temperature in more extreme atmospheric conditions, and have pointed out the accompanying dangers of heat-stroke. The relation between the bodily temperature and external cold has not been so fully studied, but enough is known to warrant the statement that, in normal individuals at least, the bodily temperature can be to a considerable degree controlled by controlling the temperature and the humidity of the surrounding air. External temperature exerts likewise a definite effect on the circulatory system. The rate of the heart-beat is increased in warm, humid, and decreased in cool, dry air. The New York commission found the average rate of its subjects confined in an atmosphere of 86° F. and 80 per cent rela-

tive humidity to be 74, and in an atmosphere of 86° F. and 50 per cent humidity 66. Eastman and the writer have seen the pulse-rate increase by 39—from 67 to 106—as the temperature of the air surrounding the subject rose from 74° to 110° F. and the humidity from 58 to 90 per cent. The important and involved topic of the relation of atmospheric conditions to blood-pressure the writer must leave until the abundant data that have been accumulated by the New York commission have been subjected to a more careful examination than has as yet been possible.

Atmospheric conditions exert on the respiratory system effects of various kinds. On the rate of respiration a moderate degree of heat and humidity seems to be without effect, but there is some evidence that more extreme conditions cause a quickening of the breathing, and this probably accompanied by more shallow respirations. The more extreme conditions, too, appear to result in a lowered concentration of carbon dioxide in the air of the pulmonary alveoli, although the writer cannot yet quote figures to demonstrate this. The matter is, however, important, since a lowered carbon dioxide signifies an increased content of hydrogen ions—in other words, increased acidity in the blood. Eastman and the writer are now investigating this point with much interest. The mucous membrane of the respiratory tract is markedly affected by atmospheric conditions. Exposure to heat causes increased swelling, redness, and secretion in the nasal mucosa, and these effects are more marked when the humidity of the air is high. Exposure to cold reverses the effects.

Little can be said at present regarding the action of atmospheric conditions on the nervous system. The New York commission has expended much time and effort in endeavors to detect a possible influence of atmospheric variations between moderate limits on the ability to do mental work. The subjects were given such psychological tests as canceling arithmetic figures, adding figures, mentally multiplying three-place by three-place figures, typewriting, and more complex mental performances which involve choice and judgment. The range of atmospheric variation was from a lower limit of 68° F. and 50 per cent relative humidity, and the upper limit of 86° F. and 80 per cent humidity. In some cases the air was kept quiet, in others in motion by electric fans. In neither the young men nor the young women subjects of these tests could there be detected any relation between atmospheric conditions and either the accuracy or the amount of mental work that was performed.

The relation between atmospheric conditions and metabolic phenomena is not yet elucidated. A topic that is inviting is the possible relationship between atmospheric conditions and bacterial infections. Most of the experimental observations that have here been made relate especially to the action of temperature on the course of infections, and it has generally been found that high external temperature with accompanying pronounced increase of bodily temperature checks the progress of infections that are already existing. Somewhat lower temperatures (30° F. to 35° F.), on the other hand, seem to favor the multiplication of the bacteria and the advance of the disease.

MUCOUS COLITIS AND ITS TREATMENT.

SIMON in the *New Orleans Medical and Surgical Journal* for July, 1916, reminds us that many divergent views have been entertained in the past in regard to the most effective method of handling this important and interesting disease. The prognosis at best is none too favorable, since we are dealing with a chronic functional neurosis, engrafted upon a type of patient who presents always great therapeutic difficulties. The first step should be directed, of course, toward the removing of any gross pathological lesion which might serve as the starting-point for a reflex neurosis. When visceroptosis is present in connection with the disease, Simon believes it is the first duty of the physician to institute proper

mechanical measures looking to the relief of this disability. Likewise, the presence of a chronic appendicitis, or other chronic inflammatory lesion in the lower abdomen, should call for appropriate surgical attention. In addition, it need hardly be mentioned that all procedures which tend in a general way to promote the tone and nutrition of the patient should be afforded a prominent place in the treatment.

The harmful effect of a coexisting constipation is to be recalled, and Simon is firmly of the opinion that no material benefit can be rendered the individual with mucous colitis until definite steps are taken to relieve this state. For this purpose a proper dietetic régime must be ordered. The type of diet which has been found of most service includes those articles of food which leave a large residue of undigested material in the bowel. The patient should accordingly be ordered to reduce the amount of meat and eggs to a minimum and, on the other hand, to eat liberally of the coarser vegetables, fruit, wheat bread, and fats. Simon is in the habit of giving twice a day half a glass of sweet cream, either with or between meals. The fat in these cases serves the double purpose of stimulating intestinal peristalsis and of increasing the number of food calories so necessary to the upbuilding of the nutrition.

A point of some importance, he believes, likewise, is the insistence on the part of the doctor that large amounts of water be drunk at intervals during the day. Very many of these patients neglect this important matter and in consequence suffer an unnecessary and harmful depletion of the tissues and secretions in general.

As regards the advisability of rectal irrigations, so commonly employed, Simon would like to offer some objection to this plan of procedure. He believes much more harm is done by a daily tampering with the lower bowel in this type of patient than the possible good that might be accomplished by the mere washing out of the mucus.

It should be remembered always that the underlying pathology is not of an inflammatory nature, therefore the various astringent and antiseptic bowel flushes ordinarily employed cannot be said to be in order. Even the oil enemata, according to the Fleiner method, Simon believes are open to the same objection and should be used sparingly, if at all, in this disease. If a mild laxative is needed, in addition to the diet, he sees no objection to the use of petroleum oil by mouth or even small doses of cascara. Certainly all drastic purges should be interdicted.

When pain is a prominent symptom, he has found a sedative suppository containing orthoform, belladonna, and ichthyol to serve admirably as a means of relief.

EXOPHTHALMIC GOITRE.

The *New York Medical Journal* of July 8, 1916, contains an article by AIKEN in which he makes the statement that the treatment of cases of exophthalmic goitre is always difficult, and demands a maximum of good judgment on the part of the physician if he wishes to obtain a successful result without referring them to the surgeon for thyroidectomy. It is a mistake to assume that the condition is practically incurable by medical treatment, and after a careful study of its results in the hands of various writers, including Hale White and Mackenzie, Solis Cohen concludes that there is a reasonable prospect of recovery in about seventy-five per cent of the cases, which is about the same proportion as that allotted to surgery in the hands of competent surgeons. At the same time there is no doubt that for some cases surgery is imperative, and in this respect each case should be judged on its own merits. Whatever the treatment adopted, it is exceptional for all the symptoms to disappear completely, but most authorities agree that we are justified in speaking of cure if the general condition and strength are maintained, and the symptoms are relieved to such an extent that the patient is able to resume her ordinary occupation.

The brief account which has been given of the various hypotheses in regard to the

causation of the disease makes it obvious that in the treatment it is essential to adopt measures tending to reduce excessive vascularity of the gland, thereby diminishing secretion and the tendency to hyperthyroidism. With this object in view it is absolutely necessary to secure for the patient the most complete bodily and mental rest obtainable under the circumstances, thus removing the stimulating effect on the thyroid of exercise and excitement. In some of the slighter cases a simple rest and isolation cure alone may relieve the symptoms, and if persevered in for some considerable time result in subsidence of the enlargement of the gland. During the first stage of the treatment rest should be so complete that it should not even be disturbed by the administration of medicaments. The length of time during which it is advisable for the patient to remain in bed varies in accordance with the progress of the case. The best guide in this respect is the condition of the pulse. When it has remained regular and practically normal for three or four weeks, the patient may be allowed to rest on a sofa in the room for an hour or so daily, and subsequently increase the amount of exertion very gradually day by day. The benefit of the rest cure is likely to be greater if it is possible to take it in the country, preferably in a bracing climate, and away from the ordinary surroundings of the patient.

Defective nutrition is commonly associated with this disease, and therefore a liberal and nutritious diet, similar to that often recommended in pulmonary tuberculosis, is frequently indicated. Foods rich in extractives should be avoided, the diet consisting chiefly of milk and cereals, together with fruit and the more easily digested vegetables. It should be borne in mind, however, that gastric hyperacidity is present in not a few of these cases, and that under such circumstances it is advisable to forbid acid fruits.

As regards the medicaments which have been recommended, their name is legion, and the most contradictory opinions are given by different writers as to the efficacy of most of them. Opinions differ as to the advisability of giving hypnotic drugs, such as veronal, sulphonal, and trional. Some writers recommend them for the purpose of procuring sleep and lessening excitability, while others emphasize the fact that in neurotic cases of this description the drug habit is easily formed, and not so easily given up. Williams thinks that the only sedative drug permissible is aspirin. The benefit sometimes derived from belladonna is due rather to its property of controlling glandular secretion than to its sedative qualities.

Of the bromides the only preparation which has been found useful is hydrobromide of quinine, which is highly recommended by Miller, Forchheimer, and others. Bumsted states that with it he has been able to cure several cases which had previously proved refractory to all other forms of treatment, including operation, and that one of its advantages is that it can be taken for months together without bad effects. In Aiken's own practice he has found that the most effective drug treatment is the administration of this preparation in the form of capsules or cachets, each containing five grains of hydrobromide of quinine and one grain of ergotin, the dose being given three times daily.

Leigh Watson reports beneficial results from the injection of 1 to 4 Cc. of a 30- to 40-per-cent solution of quinine and urea in fifty cases of exophthalmic goitre, the dose being repeated every third day. Two severe cases remained free from symptoms eighteen months after the last injection, and sixteen have been free from symptoms for one year.

On the assumption that exophthalmic goitre is more common in districts in which the water is deficient in lime, treatment by the administration of calcium salts has been recommended. Campbell states that during the last eighteen months he has been in the habit of treating his cases in this way, and has had better results than from any other form of medication. He does not suggest that it should be the only treatment, but that it should be combined with any other

form of treatment selected. He gives a dose of ten grains of chloride of calcium daily.

In view of the liability to digitalis toxemia in toxic conditions of the thyroid many writers emphasize the desirability of avoiding the use of this and other cardiac drugs, except in cases in which special indications, similar to those in organic disease of the heart, are present. Weiland points out that such indications are absent in the cases in which some surgeons recommend a dose of digitalis before operation, and that they should therefore be included in the category in which the drug is contraindicated.

Some writers state that they have obtained satisfactory results from administration of extract of the thymus gland, but the reports as regards treatment by organotherapy, including the administration of thyroid substance, are on the whole not very favorable, and do not compare with the brilliant results obtained in cretinism and myxedema from organotherapy. Serum from thyroidectomized sheep and milk from thyroidectomized goats are sometimes used in the forms of preparations known as rodagen, thyroidectin, antithyroidin, and have been found useful in some cases.

The fact that *x*-rays are known to have a selective effect upon glandular tissue justifies the assumption that their use may be beneficial in exophthalmic goitre, and they have accordingly been extensively used, both alone and in combination with surgery. Satisfactory results are reported by several writers, and Kienbock, Nagelschmidt, and others go so far as to say that no operation for this condition should be undertaken without preliminary treatment by *x*-rays, and that if this procedure were universally adopted it would be likely materially to reduce the operative mortality of exophthalmic goitre. Belot is of the opinion that even in the so-called abortive cases in which struma is absent, the rays have a favorable influence on excessive and dysfunction (deficient or perverse function) respectively of the glands of internal secretion, even if these abnormalities are not associated with appreciable enlargement. Dr. Dawson Turner reports successful cases, in which application of the *x*-rays was followed by diminution in the size of the thyroid and subsidence of the symptoms. This retrogressive process was associated with atrophy of the secretory epithelium and interstitial and extracapsular fibrosis.

Clinical experience shows that many cases do not respond satisfactorily to any of these methods, and in these refractory cases Aiken has found the employment of radium to be of decided benefit. Abbe, of New York, first used radium successfully in exophthalmic goitre, and his favorable experience of its results has been repeatedly confirmed by other writers. The experiments of Victor Horsley and Finzi show that the most constant changes after the application of radium affect the blood and lymph vessels. Aiken's own clinical experience shows that, when applied over the thyroid, the more penetrating radium rays diminish the vascularity and reduce the secretion of the gland.

SECOND THOUGHTS ABOUT SALVARSAN THERAPY.

In the *California State Journal of Medicine* for July, 1916, STEVENS writes on this topic. His conclusions may be expressed in the form of "Don'ts":

Don't use salvarsan unless positive indications for its employment exist.

Don't expect as much from neosalvarsan as from salvarsan.

Don't give salvarsan in the office.

Don't give salvarsan at too frequent intervals, or in too small doses.

Don't omit any details in preparing the solution to be injected.

Don't neglect to filter the solution before it is injected.

Don't cut down on a vein.

Don't inject any of the solution into the tissues surrounding the vein.

Don't administer too large a dose at the first injection, especially in the early secondary stages.

Don't inject salvarsanized serum pre-

pared from a Wassermann positive blood into a canal containing Wassermann negative spinal fluid.

Don't inject a quantity of salvarsanized serum larger than the amount of spinal fluid removed.

Don't inject air into the spinal canal.

Don't use intradural medication under any circumstances until the intensive treatment with intravenous injections of salvarsan, mercury inunctions or injections, and potassium iodide has been given a thorough trial.

A TRUSTWORTHY NON-POISONOUS ANTISEPTIC.

In the *New York Medical Journal* of July 8, 1916, GREGORY says it is a good time to remind the entire medical profession, and especially the surgical end of it, that calendula will kill all pus germs. As the drug may not be familiar to some, he will say that he refers to the non-alcoholic fluid extract of calendula, which is *Calendula officinalis,* the common or garden marigold. Perhaps fifteen years ago Gregory read in some medical journal that "a good extract of calendula will absolutely prevent the formation of pus in all contused and lacerated wounds, no matter how dirty, unclean, and far from aseptic they may be." He concluded that this statement was probably exaggerated, but tried the remedy, and found that it made good in every instance. He has done a good deal of accident and emergency surgery, and has had some exceedingly filthy wounds to treat, caused by railroad and stone quarry accidents, contaminated by coal dust, machine oil, and dirty clothing, and not one of them has ever produced a drop of pus when dressed with a good extract of calendula.

Extensive burns are pretty sure to become contaminated from burned clothing and other causes, and if dressed with linseed oil and lime water will be covered with foul, yellow pus in about two days. If dressed with calendula and saturated solution of boric acid, the burns will remain perfectly clean and sterile till healing is complete. Besides its antiseptic qualities, calendula alleviates the pain of burns better than any other remedy ever discovered. It is so much better than dilute picric acid that any one who has used it for burns will never care to use the acid. Gregory wishes to make his meaning perfectly clear; he does not mean that it has sometimes, or occasionally, prevented pus formation in dirty wounds, but that it has absolutely inhibited the formation of pus in every wound that he has ever dressed with it.

If you ask him how it does this, he has to say frankly that he does not know, as chemistry can tell us nothing about it that he knows of. It is a non-poisonous plant, often used internally, and is the best remedy he has ever found for a certain very acute and inflammatory type of gastric catarrh.

If any of the readers of the *New York Medical Journal* have been called to treat a badly bruised or wrenched knee-joint with a violent acute synovitis rapidly setting in, they know what wreck and ruin is likely to take place unless the doctor is both energetic and skilful. In a case like this, two ounces of concentrated extract of calendula, six drachms of lead acetate, to one pint of hot water, applied on compresses of absorbent cotton, will work a wonderful cure. The lotion must be applied very hot, and the compresses must be changed before they get cold. This treatment, faithfully and energetically followed up for three days and nights, will positively prevent effusion, suppuration, and the wrecked and ankylosed knee-joints that he used to see in his hospital days. This treatment is equally good for a badly sprained ankle.

He wishes especially to warn the profession to get a reliable preparation of this remedy, as there is much on the market that is almost worthless. The reliable fluid extract is so concentrated that it is almost of the consistence of syrup. In that form of erysipelas in which a light-red surface is interspersed with numerous pustules, and which is most certainly a mixed infection, calendula, lead acetate, and saturated solution of boric acid will effect a prompt cure.

An exceedingly efficient treatment for very bad cases of leucorrhea contains equal parts of non-alcoholic calendula, non-alcoholic hydrastis, and glycerin. This prescription can be used on tampons, or with hot water as a medicated douche. Where patients object to the present very high price of hydrastis, the calendula, boric acid, and glycerin can be used with great success.

General knowledge of the power of calendula as a germicide, and its general use in hospitals and surgeries, would prevent thousands of cases of infection and suppuration every year. It is no new or experimental remedy. It has been thoroughly tried out. It has stood the test of years, and it is absolutely sure death to all pus germs whatsoever. But it must be the right calendula. Many a man, not knowing good from bad, has tried some preparation of the drug, got no good results, and concluded that the claims made for it were false.

SPINAL ANÉSTHESIA AND ITS USE IN THE TRENDELENBURG POSITION.

In the *Lancet* of June 24, 1916, STEWART writes upon this topic. The use of the Trendelenburg position in the production of spinal anesthesia is not, of course, a new procedure, as it was advocated many years ago by Jonnesco and other continental surgeons, of whom Saradnicky reported 600 cases without any bad result. In the last few months Stewart has used spinal anesthesia in nine cases in which the Trendelenburg position was employed: (1) Wertheim's operation for carcinoma uteri; (2) three cases of pyosalpinx (one of both tubes); (3) two cases of prolapsus uteri (Gilliam's operation); in one case appendicectomy also done; (4) one case of parametritis and pelvic peritonitis; (5) two cases of suprapubic prostatectomy. There were no bad effects or after-effects, except slight headache in one case. By giving a preliminary injection of morphine and atropine Stewart has found it unnecessary to give general anesthesia in these cases.

Stewart notes that in Page's list of cases ventral hernia, intestinal obstruction, gastrojejunostomy, ruptured liver, are mentioned, in which he presumes the Trendelenburg position was employed only for the purpose of producing anesthesia, etc., and not for facilitating the operation, as such a position would increase the dangers and difficulties of the operation; although if such be the case he cannot quite understand the reason for waiting fifteen or twenty minutes before placing the patient in the Trendelenburg position. Page does not state the site of his injection, but it is surely unnecessary to resort to the Trendelenburg position for such cases, as complete anesthesia of the whole abdomen can be obtained usually in five minutes by injecting into the space between the twelfth dorsal and first lumbar vertebræ.

Stewart has employed this method in many operations on the upper abdomen, such as perforated gastric ulcer, gastroenterostomy, gastrostomy, acute intestinal obstruction, etc., with perfect anesthesia and complete relaxation of the abdominal walls, merely raising the buttocks for a few moments until anesthesia is produced, and keeping the head and shoulders slightly raised all the time, thus obviating the danger of respiratory failure. In using the dorsolumbar method for operations in the upper abdomen Jonnesco kept the patient in the sitting position for a few minutes, and afterward in the dorsal position with the head raised, only resorting to the Trendelenburg position for a few minutes when the anesthesia was incomplete. Stewart has seen no bad effects, however, from placing the patient in the dorsal position immediately after the injection, and the anesthesia is surer and produced sooner.

It was pointed out by Jonnesco that injection in the dorsolumbar space gives a more perfect anesthesia than in the classical site between the third and fourth lumbar vertebræ, and Stewart is convinced that the percentage of failures requiring general anesthesia is much less if one employs the higher site, while he has had no bad effects in over 100 cases in which he has used this

method. He ought, however, to add that for injections in the dorsolumbar space he invariably uses a mixture of strychnine and stovaine (average dose 6 cgr. stovaine and 1 mgr. of strychnine prepared in ampoules by Martindale) as originally advocated by Jonnesco. For operations in which the Trendelenburg position is employed the addition of strychnine seems especially desirable to obviate the risk of respiratory failure.

TREATMENT OF ECLAMPSIA.

In the *American Journal of Obstetrics* for July, 1916, KNIPE and DONNELLY point out that each plan of treatment has its earnest advocates. This is natural and to be expected, as it is in every problem of medicine about which there may be a difference of opinion.

And yet, owing to the fact that we are accustomed to look to surgery for quick results in so many pathological conditions, so the operative treatment of eclampsia has become unduly popular in the last five years, to the exclusion of older methods which have been tried and not found wanting.

Knipe and Donnelly believe that this is a mistake. They show by the analysis of eighty-three cases which have been treated during the last five years in the University Maternity that their results have been better and their mortality lower than by any radical operative treatment that they know of.

The treatment that is prescribed at the University Maternity is as follows:

Lavage of the stomach; 2 ounces of castor oil given through the stomach-tube; twenty to thirty minutes' sweat in the sweat cabinet; hypodermic of morphia, gr. ½, is given if the convulsions are violent or frequent; hypodermoclysis after the first sweat, followed by proctoclysis midway between the subsequent sweats; venesection if systolic blood-pressure is over 180, and more particularly if the diastolic pressure is high; an initial dose of veratrum viride (10 minims) followed by nitroglycerin gr. 1/100 at four-hour intervals. Puncture of membranes if pregnant or in labor and abstention from any operative interference to hasten delivery, which they find is spontaneously terminated in from eight to ten hours from the institution of treatment.

It is not their purpose to draw attention to anything except the treatment of eclampsia, but it is necessary to elaborate somewhat on the type and severity of their cases, so that we may infer the results of the treatment.

Of the eighty-three cases of severe toxemia of pregnancy treated in the Maternity from 1910 to 1916, forty-eight had convulsions before delivery. Of these they have a definite record of seventeen having had convulsions after delivery also, but as the details of some of the records were rather poorly kept during this period, it is reasonable to presume that there were more than seventeen cases in which the convulsions continued after delivery because the eliminative treatment was continued for quite some time.

Twenty-four had convulsions after delivery only. Of these, four died, a mortality of 16.66 per cent.

Ten cases were admitted in various stages of their pregnancy with severe toxemia and all the symptoms of impending eclamptic convulsions. These cases were relieved by eliminative treatment, and either discharged before delivery or delivered without the onset of convulsions.

Two cases were delivered by vaginal section—with one death immediately after delivery.

Six cases died within a very few hours after admission and after delivery. Of these, four cases never revived from the state of coma in which they were admitted.

One case died in a convulsion after being delivered.

Another case, delivered before admission, died suddenly after responding well to eliminative treatment. Post-mortem showed cerebral embolism.

Four cases had previous attacks of eclampsia, one case having had convulsions in two former pregnancies.

Craniotomy was performed in one case.

One case died in the hospital, one month

after admission, of general toxemia and nephritis.

The total mortality of these eighty-three cases, whether the deaths occurred only fifteen minutes or one month after admission, was fourteen, or 16.8 per cent. If they exclude those cases dying within twenty-four hours, but including the case dying a month afterward, their mortality was five, or 6 per cent.

It is hardly reasonable to include cases dying within twenty-four hours in any statistics upon eclampsia. Even those favoring Cæsarian section in all cases will admit that the ratio of their success is in inverse proportion to the number of convulsions, and therefore it is reasonable to assume that cases admitted so late in the disease as to die within twenty-four hours would be so saturated with toxemia that any operative procedure would be unavailable. Therefore, they repeat, if they exclude those cases dying within twenty-four hours, most of them within a few hours, their mortality is 6 per cent.

It may be well to draw attention at this point to a very important fact, and that is, within the last five years there has been a tendency on the part of those doing Cæsarian section for eclampsia not to include cases of postpartum eclampsia in their statistics. As we have seen, those cases developing eclampsia following delivery have been a considerable proportion of their total number, namely, twenty-four out of eighty-three, and as is well known, these postpartum cases have a higher mortality than those developing convulsions before delivery.

THE TREATMENT OF ASTHMA, ARTHRITIS, AND GONORRHEA BY PHYLACOGENS.

In the *Medical World* for July, 1916, HAY reports his results with phylacogens. He says that in some cases of asthma results have been brilliant, but not so generally favorable in hay-fever; in rheumatism just enough splendid results to keep him looking to phylacogen as a remedy that should be included in the armamentarium of every well-equipped physician. While there are some disappointments in the administration of phylacogen, a certain percentage may be justly attributed to errors in diagnosis and to certain cases that, for some unaccountable reason, fail to respond to this form of active immunity.

To summarize the results in the cases treated by Hay, he finds that 79.1 per cent have been cured or improved very materially, while only 20.9 per cent have failed to be benefited. In a majority of the cases the failure no doubt was due to incorrect diagnosis. With his own experience and after reading many case reports of reputable physicians, he is convinced that the phylacogens are the most efficient, reliable, and satisfactory therapeutic agents now available for treating conditions where indicated.

AURICULAR FIBRILLATION: ITS RECOGNITION AND TREATMENT.

GORDINIER in the *Albany Medical Annals* for July, 1916, makes the somewhat broad statement that no form of cardiac disorder is more amenable to proper digitalis medication than auricular fibrillation. He thinks if we will pause for a moment to review the salient features of this disordered cardiac mechanism, we will find ample justification for the above statement. For with the inception of this abnormal rhythm the whole myocardium is rendered more irritable from overexcitability, the result of innumerable stimuli constantly flowing from the auricles to the ventricles over His's bundle. This constant increased conductivity rapidly exhausts the two most important functions of the heart muscle, contractility and tonicity. We have been taught both from animal experiments and clinical studies that digitalis reduces cardiac rate by vagus stimulation through its effect on the cardioinhibitory centers in the oblongata, as this action may be inhibited by blocking the vagus impulses through the administration of atropine. It has also been known for a long time that this drug has a selective action directly on the muscle fibers of the

heart independent of their nerve supply, improving in marked degree the functions of contractility and tonicity. In addition we know from polygraphic and electrocardiographic studies that one of the earliest effects of digitalis is to delay conductivity through the bundle of His by increasing the auriculoventricular interval, causing, if the action is pushed, definite heart-block. This action of the drug is valuable in fibrillation by reducing the number of impulses from the auricles to the ventricles, thus relieving their irregularity, slowing their rate, and increasing their period of rest, thereby permitting a proper filling of the ventricular chambers. It also strengthens their systolic contractions, thus relieving them of their residual blood and increasing each systolic output, with ofttimes complete relief of the general venous stasis.

In laboratory animals and healthy men digitalis increases blood-pressure by constricting the small arteries through vasoconstrictor influences. On diseased hearts, however, great discrepancy of opinion exists as to whether such pressure effects ever occur. It seems reasonable to believe, especially with fibrillation with edema and low blood-pressure, that such results occur, chiefly through its effect on improving the contractile force and tone of the heart muscle, thus improving the systolic output, thereby reducing the size of the dilated chambers by relieving them of their residual blood and permitting a better coronary arterial flow, thus improving the nutrition of the heart muscle. Its diuretic effect is not primarily renal but is doubtless due to its selective action in increasing the force and strength of the heart muscle, thus delivering to the kidneys a greater volume of blood, relieving their venous stasis, and relieving the general edema by producing active diuresis. Clinical experience teaches that when a good active preparation of digitalis fails to influence for good the strength of the heart, no increased urinary output occurs. Because of these well-known pharmacologic actions of the drug, we have in digitalis a most valued weapon, whereby we may relieve and prolong the lives of these unfortunate patients so that they may live months or years with comparative comfort, often being able to work at their usual vocations.

The effects from the use of digitalis or allied drugs in fibrillation are oftentimes no less than marvelous, patients in immediate peril of death being relieved as if by magic; the deficit between the cardiac impulse and radial artery gradually ceasing, the dyspnea and edema fast disappearing, the irregularity of rhythm and rapid rate quickly improving; and in the case of fibrillation associated with mitral stenosis the presystolic murmur long since absent often reappearing with the improvement of the functioning of the auricles. The drug to be effectual must be used at first in doses sufficiently large to produce definite physiological effects—*i.e.*, distinct lessening of the irregularity and slowing of the pulse-rate, the rate of apex and the radial pulse gradually becoming the same. When their rates reach seventy per minute it is wise to discontinue the drug for a few days, carefully watching the heart-rate in the interval, and if it again becomes rapid, reaching ninety or more, then to give enough digitalis to keep it at about the normal rate, thus continuing the smaller doses over long periods of time, only ceasing when the rate keeps normal and no deficit occurs, or the drug produces some toxic effect, such as vomiting, severe headache, marked sinus irregularity, delayed conductivity, bigemina, or actual heart-block.

No drug of this series can in the writer's judgment approach at all the good effects of an active preparation of digitalis. It is true that occasionally certain individuals seem to possess an idiosyncrasy for the drug and can take it neither by the mouth nor subcutaneously. In such patients the drug may be used intravenously, or the substitution of strophanthus, squills, convallaria, adonis, or spartein may be tried. The writer's preference is either for a good tincture, a fresh infusion, or recently collected dried and compressed leaves. In

endeavoring to bring prominently before us the great value of this drug in the treatment of fibrillation, he does not wish in those cases of fibrillation with edema to underrate the good that comes from absolute rest, restricted fluid intake, salt-free diet, and careful elimination, or in combination with digitalis of such diuretics that act upon healthy renal epithelium, as caffeine, theobromine, theocin-sodium acetate, or agurin. These latter drugs should not be given in pure renal dropsy. The writer wants also here to emphasize the fact that belladonna or atropine should never be administered in this condition, unless for some very definite reason, such as the onset of a sudden fulminating attack of pulmonary edema, as its action is to paralyze the peripheral terminations of the vagus nerve, thus accentuating the fibrillation.

In closing, just one other point, namely, the value of caffeine in overcoming digitalis arrhythmias that do not cease when the drug is discontinued.

REAMPUTATIONS.

SKIRVING (*Journal of the Royal Army Medical Corps*, May, 1916) noted many stumps which required reamputation because of the skin turning in, leaving bare the bone and at times causing retention of pus. Plenty of bone should be taken away. The vessels were hard to catch because of the hard inflammatory tissue in which they were embedded. Drainage should be free. Secondary amputation wounds were usually actively infected and were best treated by continuous irrigation. Secondary hemorrhage was fairly common. Traction on flaps was required to prevent a recurrence of the skin growing in.

SPINAL ANESTHESIA.

KNIGHT (*American Journal of Obstetrics and Diseases of Women and Children*, June, 1916) reports 305 cases—all below the diaphragm, almost all below the umbilicus. There was no fatality.

Strauss reports a mortality of 1 in 3500; McCardie reports 23,955 cases with 29 deaths, or 1 death in every 826 cases; König reports 2400 cases with 12 deaths, or 1 in 200; Thomaschewsky, 1 in 17,847.

The majority of fatalities occurred in the early experience with this method, but with the improvement of technique the mortality has been reduced.

When a solution of an anesthetic is introduced into the fluid of the cerebrospinal canal it either rises or falls, as its specific gravity varies in relation to that of the cerebrospinal fluid. The cerebrospinal fluid has a fairly constant specific gravity of about 1.0065. It is therefore important to have the anesthetic fluid distinctly heavier or lighter than the spinal fluid, and also important to place the patient in such position that the anesthetic fluid will flow toward the distal extremity of the spinal canal. As the anesthetic comes in contact with the nerve roots it blocks their impulses more or less completely, thus causing loss of sensation and motion. The autonomic organs remain uninfluenced. After the injection the loss of sensation, pain, motion, and touch gradually increases from below upward and in the order given. The sense of touch is the last to disappear. In many cases it remains throughout the operation, varying in accordance with the amount of anesthetic and the susceptibility of the individual. The persistence of the sense of touch is occasionally a great handicap in the management of nervous individuals, for as these patients are usually apprehensive they may complain, when the operation is begun, and interpret their sense of touch as pain, when in reality their sense of pain has been abolished.

Anesthesia begins a few seconds after the injection and lasts about an hour, varying more or less with the dose and the size of the individual. The abdomen becomes relaxed when the anesthesia is established; abdominal breathing is minimized, as well as efforts at coughing and straining. A considerable number of patients are nauseated or vomit in the early period of the anesthesia, but this is very transitory and usually of little moment. The intestines,

which are of autonomic control, show active peristalsis and are never paralyzed by the anesthetic.

The anal sphincter becomes relaxed, and consequently operations about the anus and rectum are facilitated.

The bladder sphincter apparently does not participate in the same relaxation, for no cases of incontinence have been noted, and furthermore it is of importance to use the catheter in individuals who receive large quantities of fluid in one way or another during or shortly after operation, as the bladder may become distended before the anesthesia is abolished.

Blood-pressure is uniformly reduced in proportion to the amount of anesthetic used. The higher the cord is anesthetized the greater will be the extent of vasomotor paralysis. The effect on the blood-pressure is at its maximum early in the anesthesia, and after a few minutes gradually passes off. Owing to this phenomenon myocardial disease, and any condition accompanied by hypotension, contraindicates the use of spinal anesthesia. On the other hand, any condition accompanied by hypertension should be materially benefited by it. Therefore it is indicated in conditions of the heart affected by pressure, as arteriosclerosis, nephritis, in labor during the overload of a weakened heart, in pulmonary tuberculosis, during the hypertension of eclampsia, and in conditions where shock is anticipated from the operative procedures.

The pulse-rate rarely changes throughout the anesthesia.

Respiration should be observed with the greatest watchfulness, for it is with this function our danger lies. The respirations will become diminished in proportion to the height of the cord involved. It is important to keep the patient in such a position as to compel the anesthetic to flow in the opposite direction to the respiratory center. Stovaine applied to the upper cervical segments of the cord, in sufficient quantity, will cause paralysis of the respiratory muscles, and if artificial respiration is not resorted to death will ensue. Should such an accident occur, artificial respiration should be persisted in until the effect of the anesthetic on the respiration passes off. The author has had but one such experience. The patient suddenly ceased to breathe. The pulmotor was applied for ten minutes before any voluntary effort at respiration was made, yet at the end of thirty minutes normal respiration was restored. With the use of an anesthetic solution which is lighter than the spinal fluid, and with the patient in an exaggerated Trendelenburg position, there is little if any danger of paralyzing the respiratory center.

The after-effects seem to be greatly exaggerated in the minds of those prejudiced. Postoperative vomiting occurred in 3 per cent of the cases, and headache, with or without pain and stiffness in back of neck, in one per cent of the cases.

Complete failure of anesthesia occurs in 1½ per cent of the cases, and later this was found to be due to the old age of the anesthetic solution.

In two cases the anesthesia was delayed. These cases received ether, and upon recovering from the ether the lower portion of the body was paralyzed and anesthetic.

Supplementary anesthetics were used in 10 per cent of the cases. In a few of these, the cases in which the operations were unduly prolonged, and in a few of the abdominal cases, ether in small amounts, nitrous oxide, or novocaine injected locally was resorted to.

Narcotics were given in one per cent of the cases prior to the anesthetic. Morphine is objected to by some operators, as it is also a respiratory depressant and might add to the depressant effect of the stovaine.

The preparation of the patient for the anesthetic is the same as for a general anesthetic, except that the taking of fluids is unrestricted.

One hour before leaving the bed, a hypodermic injection is given consisting of morphine sulphate gr. ¼ and atropine sulphate gr. 1/150, and a sufficient amount repeated to allay all anxiety and produce drowsiness and indifference, or the so-called "twilight state." Absolute quiet about the patient is maintained, and before re-

moval to the operating-room the eyes are blindfolded and the ears covered so that surroundings are excluded as much as possible from the patient's knowledge, and the transfer to the operating table is made as gently as possible. The patient is placed in sitting posture upon the table with legs hanging over the side and shoulders drooped, with head resting upon the attendant's shoulder so as to bow the vertebral column as much as possible, thus giving maximum separation of the spines.

Tincture of iodine is applied to a liberal area of the back surrounding the site of puncture. The third or fourth interspinous space in the lumbar region is located.

The site of the injection is anesthetized by ethyl chloride and the trocar and cannula placed with its point at the upper limit of the interspinous space, and immediately below the tip of the spine.

The trocar and cannula are now gently pushed in, in the middle line and at right angles to the vertebral column, until it meets with some considerable and elastic resistance, which is the membranes of the canal and the immediately adjacent ligaments. A slight increase in the thrust will puncture the canal, and upon withdrawing the trocar a few drops of the spinal fluid may be allowed to escape, to prove the position of the cannula. One should never be satisfied that the cannula has entered the spinal canal until he sees the escape of the spinal fluid. Should the cannula be inserted too far it may penetrate the filaments of the cord and cause pain in the lower extremities; it should then be withdrawn a little until the spinal fluid runs out freely.

Dr. Babcock's solution of stovaine was used in all the writer's cases. Its specific gravity is less than that of the spinal fluid, and consequently the patient is placed in an exaggerated Trendelenburg position immediately, so as to limit its action to the lower filaments of the cord. Should the patient be unable to sit up, the injection may be made in the horizontal position.

Dr. Babcock's solution is dispensed in 2-Cc. ampoules, sterilized and ready for injection, and consists of stovaine 0.08, lactic acid 0.02, absolute alcohol 10.2, distilled water q. s. 2 Cc.

The amount of solution injected varies somewhat with the size of the individual, usually from 1 Cc. to 1.6 Cc.

The point of the trocar and cannula should have a sharp and short bevel, for if the bevel of the point is too long only part of the opening may enter the canal, and then when the injection is made it may escape into the tissues outside the cord and a failure will result.

The trocar should be of small caliber and about 10 cm. long, with a connection ground to fit the outlet of a 2-Cc. Record syringe. The syringe and needle should never be used for any other purpose, and should always be sterilized by boiling in plain water. Alkalies or antiseptics destroy the properties of the stovaine and should never be used. A fine gray precipitate may form when the stovaine solution is drawn up in a syringe boiled in soda water, and the anesthetic action of such a solution may be completely destroyed.

CONCERNING GUNSHOT INJURY OF THE PERIPHERAL NERVES.

STOPFORD (*Lancet*, April 1, 1916) from the observation on behalf of the Medical Research Committee on upwards of 90 cases suggests that the following factors must be considered as influencing the prognosis and treatment:

The extent, character, and distance from the periphery of the injury. Extensive damage to the surrounding structures increases the formation of scar tissue, which by its contraction is liable to strangle the nerve. Irregular missiles, as shell casing, tend to lacerate the nerves themselves more than bullets. A nerve which is in a state of tension at the time of the reception of the injury is more likely to be torn than one which is lying slack, and consequently the position of the limb influences slightly the predisposition to laceration. It is well known that peripheral injuries of nerves have a better prognosis than more central ones in the region of the nerve roots.

Such complications as fracture and sepsis obviously add to the gravity of the prognosis. They both magnify the risk of secondary implication of the nerve in either callus or fibrous tissue.

The treatment before the case comes under observation is also important, as failure to relax the paralyzed muscles during the early stages appears to be a very potent cause of delay in recovery.

The amount of cicatricial tissue formed around the nerve. Excessive fibrosis and the frequency of incomplete division constitute, to a considerable extent, the differences between war injuries of nerves and those encountered in civil practice. The effect of fibrous constriction during healing is most significant in the study of these cases, and its influence upon prognosis and treatment cannot easily be overemphasized.

For convenience of discussion the clinical progress, in a large proportion of nerve injuries, may be said to follow one of the four following courses (although, it must be understood, it is not possible to include a few cases exhibiting several complications in such a graphic manner):

1. Improvement seen in the sensory manifestations within a few weeks, followed by restoration of tone and voluntary contraction in the paralyzed muscles. This is succeeded by a steady increase in power until there is a complete recovery within four to eight months. The cases following this course are probably examples of physiological division, the missile having passed close to the nerve without dividing any fibers and the wound healing without any compression of the nerve.

2. No improvement of any form even after four to six months. All of these cases are clinically examples of complete anatomical division, and surgical means alone can procure any recovery.

In these two diverse groups the treatment is obvious, but in the next considerable difficulties are encountered.

3. Fairly rapid improvement in the sensory or motor symptoms, or both, up to a point when further progress becomes more tardy but very slowly continues. These are possibly instances of incomplete anatomical division, but the divided fibers regenerate because they are in good apposition, and there is a minimal amount of cicatricial tissue. Surgery cannot accelerate the recovery of this group, and the essential point is to differentiate it from the succeeding one. As Sherren has shown, in cases of incomplete division the recovery of epicritic and protopathic sensibility is simultaneous.

4. Improvement, which abruptly ceases or is followed by a relapse. This is an important group and contains a considerable number of cases. The relapse, as may be anticipated, is almost invariably due to compression of the nerve by fibrous tissue or callus.

In the cases of relapse or sudden cessation of all recovery the nerve is found on exposure to be compressed by fibrous tissue, or to contain a fibroma or extensive intraneural scar. The progress of regeneration is interrupted by the excessive formation of fibrous tissue, which usually necessitates neurolysis or excision of the fibroma with suture of the divided fibers, and therefore it is of the utmost importance to be able to diagnose this class of cases as soon as possible from those in the previous group, in which recovery will generally occur without surgical intervention.

From his own experience it seems possible to recognize the presence of compression of a nerve in most cases by means of the simplest clinical tests for the cutaneous sensibility to "light touch" and "pain" in its sensory distribution.

TECHNIQUE OF SUPRAPUBIC CYSTOSTOMY IN BADLY INFECTED CASES.

WILLIAMS (*Annals of Surgery*, June, 1916) notes that the following procedure has been adopted during the last twelve months for suprapubic cystostomy, where a delay of a few days or a week is permissible, and in those cases in which the bladder is badly infected, in order to aid by every possible means the recovery of a patient who is often old and decrepit, with

arteriosclerosis, thickened bladder, and perhaps grave renal insufficiency.

Every surgeon knows how readily a normal bladder wall will unite when infection is absent or at a minimum, and the wall itself has been treated in a gentle and clean-cut manner. Until recently the operation was performed at one sitting, whether for the removal of a foreign body or enucleation of the prostate; but this has been largely given up for the so-called "two-stage" operation, with much better results. This procedure goes a step farther in the class of case just mentioned, in order to insure the patient against the risk of septic infiltration of the paravesical connective tissue with its often serious consequences.

Formerly surgeons went boldly down to the bladder and opened the cavity immediately. If tearing and bruising occurred, septic infiltration of the tissues sometimes followed, with unfortunate results.

The procedure adopted then to seal the wound is here briefly outlined and is quite simple:

A general anesthetic with its evident dangers in this class of cases is quite unnecessary. Some form of cocaine is used. The vertical incision is adopted rather than a transverse, so as to keep the superficial and deep parts of the wound parallel and present a solid wall on either side when completed, rather than an elongated skin wound stretching at right angles. The muscles are separated in the usual manner and the fatty tissues, with often large veins, carefully incised, but not torn or roughly handled, since hemorrhage often occurs and may be difficult to control. M. Guyon met with severe hemorrhage in his second case.

Treves lays great stress on this point when he says that "prevesical fat should never be torn through; all such rough manipulations open the way for urinary infiltration."

In order to insure safety of the peritoneum, a catheter with an ordinary bulb is previously passed through the urethra and the bladder cautiously, and with extreme care, gently inflated. A warm boric solution is sometimes used instead of inflation, and by some is considered safer. This brings the bladder wall into view and pushes the peritoneum out of danger. The fat is carefully reflected sideways and upward, and the muscle fibers of the viscus are now easily recognized.

Gussenbauer, Sonnenburg, and Krämer mention cases in which the peritoneum was adherent to the pubis. If this condition be found it matters little, since it can be dissected away, displaced upward, and, if necessary, sutured. The five or six days that elapse before the bladder is to be opened insure the safety of the abdominal cavity. The bladder is now cleaned to the required diameter, according to the object to be removed. If for simple drainage, the space may be small. A guy suture of thread or silk is placed through the muscular coat on either side, fairly close to the median line, and left *in situ*, the ends being brought up through the wound for future use. A strip of sterile gauze about 3 cm. wide is packed into the depth of the wound and into the postpubic space on either side, gradually and completely filling the cavity and forming a space perhaps 3 cm. or more in diameter. No sutures are inserted. An ordinary dressing is placed over the wound. The operation only takes a few minutes, without the least shock or inconvenience to the patient.

At the end of the fourth day at the earliest, but one week usually, the second stage is undertaken. The packing is carefully removed and the wound found to be completely sealed in all directions. The bladder wall is easily recognized, and the guy sutures point out the line of incision, which, under a few drops of cocaine, is made in a vertical direction to the required length. Great care is taken not to clamp or bruise the bladder wall in any way. The finger is carefully inserted, and a tube, if used, placed in position, the decomposing urine immediately pouring through the opening, but the granulations which have sealed the wound prevent any contamination of the paravesical cellular tissue.

During the after-treatment the skin remains normal in color without the least sign of induration. There is no pain around the edges of the opening, and the general appearance of the wound is all that can be desired. In fact, other conditions being equal, a rapid normal healing takes place, with delayed union and primary fistula brought to a minimum. The comfort of these patients is in marked contrast to the discomfort experienced after the immediate cystostomy previously performed, which often left a dusky infiltration of the skin, sloughing tissues, and all the dangers of thrombosis and sepsis, with continual care and attention of the nurse and with pain and misery to the patient.

For suprapubic prostatectomy, in the worse forms of infected bladder, the "three-stage" operation is now always performed. For vesical calculus this method is ideal.

INTRADURAL NERVE ANASTOMOSIS IN SELECTED CASES OF POLIOMYELITIC PARALYSIS.

SHARPE (*New York Medical Journal*, July 1, 1916) states that for the past two years the writer has carried out a series of experiments upon animals in nerve anastomosis in the spinal canal, to accomplish caudal root anastomosis in marked cases of paralysis of a lower extremity, following poliomyelitis. The results of these experiments will be given later. Of course, no results of nerve regeneration are to be expected until a period of at least six months has elapsed since operation.

Three cases which were operated on in conjunction with Dr. William Sharpe are reported at this early date for two reasons: (1) The results of previous experiments, and of the writer's own experiments on animals, are such as to promise well for restoration, at least partial, of function; (2) as the individual surgeon sees but a few patients with the extensive paralysis of the legs suitable for this operation, this report may arouse the interest of other neurological surgeons in these otherwise hopeless cases. The operation of intradural nerve anastomosis of the cauda equina roots is not more formidable than the frequently performed operation of laminectomy with opening of the dura. Beyond rigid asepsis and a carefully worked-out technique the greatest requirement is patience and knowledge of the anatomy of the cauda equina and the arrangement of the nerve roots.

It is too early to report upon the results of these operations.

INTRASPINOUS TREATMENT OF SYPHILIS BY SALVARSANIZED SERUM.

STONER (*Cleveland Medical Journal*, April, 1916), working for a period of fourteen months upon forty cases of the various manifestations of neurosyphilis, reports upon a total of 141 intraspinous treatments; the greatest number given to a single case being 10, the least number 1. The patients in addition were treated by mercury injections and intravenous injections of salvarsan.

The quantity of salvarsan in a single treatment has been from ¼ mg. to ¾ mg. in 15 Cc. of blood serum, the latter being salvarsanized *in vitro* according to the method of Ogilvie. The cases included tabes, paresis, hemiplegia, psychoses, dementia, meningoencephalitis, cerebral and cerebrospinal syphilis. Ten per cent are reported as markedly improved in symptoms such as pain, sphincter disturbances, anemia, and in general mental and physical state.

Twenty cases, or 50 per cent, showed a degree of improvement. Six cases showed no clinical improvement, or 15 per cent. One case, being an advanced paretic, grew progressively worse and died after two treatments.

The most striking improvement was in those cases that had had intensive general treatment without complete relief, such as cerebral syphilis with agonizing head pains. It is interesting to observe that one intraspinous treatment will give relief where much general treatment has failed. The striking illustration is the type of case that

develops signs of cerebral syphilis in the midst of active general treatment or subsequent to it, where lumbar puncture findings show a very high cell count, a positive Wassermann, and syphilitic globulin. It is this "so-called" early case that is completely relieved on intraspinous medication, and the laboratory findings on the fluid are made negative. The sense of indescribable relief that certain cases experience from intraspinous treatment is gratifying; in fact, this is so evident that certain cases ask for further treatment. This is especially true in tabes and cerebrospinal syphilis.

Ten per cent of the cases were completely negative to Wassermann, cell count, and globulin; 28 per cent were brought to a normal cell count. All findings were reduced in 50 per cent.

Intraspinous injections were provocative of positive findings which had previously been negative in 10 per cent.

The reactions from treatments consisted of exacerbation of characteristic pains of the disease, which come on in about two to four hours subsequent to treatment and disappear completely in twelve hours in most cases. Routinely, codeine sulphate in ½-grain doses is given for relief. Approximately 25 per cent of the cases had no pain reaction whatsoever. Head pains do not follow; these one not uncommonly observes following lumbar puncture for diagnostic purposes, where the patient is allowed to get up in twelve hours. One night in a hospital is sufficient to carry out this treatment safely.

The cerebrospinal fluid shows positive in approximately 100 per cent of the cases of neurosyphilis, and this is generally parallel with a lymphocytosis and a syphilitic globulin such as is evidenced by the Lange or Nonne-Apelt tests.

In this relation remarks concerning the Wassermann reaction are relevant. Swift (*Cleveland Medical Journal;* quoted from the *Journal of the American Medical Association*) calls attention to the fact that "In performing the test, five different biologic substances are employed, four of which may be considered as reagents which have not the fixed value of chemical bodies, but which vary in their properties according to the method of preparation, age, manner of preserving, and other factors which are not understood. Because of the lack of uniformity in performing the test, the results should be judged from the clinical point of view. If the reports from a laboratory vary to any marked degree when the serums from a group of patients are submitted from time to time, it is safe to conclude that the methods employed in that laboratory are not well standardized. Whatever level is chosen can be fairly closely maintained by paying attention to the following points: (1) One should have a certain standard for the various components of the hemolytic system which must be tested each day. (2) One should use several antigens and compare a new one with old ones of known value before accepting it. (3) One should insert as controls not only serums which on the previous day gave strong positive and completely negative reactions, but also a serum which has given partial fixation." His final remarks are of especial significance: "Disappearing reactions are better indicators of sufficiency of treatment in late syphilis than in the early stage of the disease. A persistent positive reaction indicates the presence of syphilis somewhere in the body, and the first three or four years of treatment should be continued until the reactions remain negative. With reactions that cannot be influenced, a course of treatment should be given annually. In aortitis, persistent reactions while the patient is under mercury and salvarsan disappeared on continued administration of iodide. Because of the variability in the various reagents and lack of uniformity in performing the test in various laboratories, it is essential that there should be close coöperation between the laboratory and the clinician, for the clinician should be the interpreter of the reaction."

In discussing the examination of the spinal fluid, Draper notes that the four examinations employed are cell count, the globulin determination, the Wassermann reaction, and the Lange colloidal gold test.

The cerebrospinal fluid shows some change in 100 per cent of early cases. The globulin test, he claims, is the first to appear and the last to go. Marked changes may be found in the fluid long before any signs or symptoms develop. He feels that even an isolated globulin increase is highly suggestive of syphilitic meningeal involvement.

Fordyce speaks of the colloidal gold test in the diagnosis and prognosis of syphilis of the central nervous system. He insists that the fate of the syphilitic individual depends largely on the early diagnosis of his infection and the intensity with which the treatment is carried out in the first six months. It is in the accomplishment of this purpose that the modern aids to diagnosis have rendered the practitioner invaluable service. Fordyce directs attention to the fact that the "tabetic syndrome may be simulated by the multiple neuritis of diabetes or alcoholism, and the real nature of the trouble revealed only by the spinal fluid analysis and the blood test. On the other hand, patients with syphilitic involvement of the central nervous system and suffering from obscure pains, febrile attacks, irritability, gastric and rectal crises, memory failure, etc., are often treated for years for neurasthenia, rheumatism, neuritis, surgical affections, and various other conditions." In the light of recent investigations, no analysis of spinal fluid is complete unless the Lange test be done. As a rule it parallels the other findings, but its greatest value is in distinguishing between paresis and the conditions which resemble it.

THE TRANSPLANTATION OF FREE FLAPS OF FAT.

KANAVEL (*Surgery, Gynecology, and Obstetrics,* August, 1916) records his experience with this procedure in attempts to prevent contractures and adhesions about tendons, nerves, blood-vessels, and joints, to favor repair and lessen deformity. The fat was usually taken from the abdominal wall; in a few instances, when the fascia lata was also desired, from the thigh. The flaps varied from one-quarter to one inch in thickness.

Four cases were treated successfully for the mobilization of old scars.

In four cases transplants were used in an effort to prevent edema following extensive dissections about blood-vessels. Three of these were after breast amputations, and the results were not satisfactory, the flaps coming away either in one piece or by a process of liquefaction necrosis. In the fourth case, in which the transplant was inserted in the inguinal region, healing took place by first intention, and the patient was well one year later.

Transplantations of fat about tendons and nerves were uniformly successful.

Two cases of transplantation into cavity left after the resection of tuberculous joints, the seats of mixed infections, were of doubtful value. One case (wrist) discharged for eight months, and then healed with 30-degree motion; the other had not healed eight months after operation, at the time of writing. The author has not used the method in operations on cases in which sinuses were not present.

In regard to the value of the transplantation of fat to maintain movement in joints after operation for ankylosis (of wrist) Kanavel comes to the following conclusion: "Where the ankylosis has been little complicated the results have been satisfactory, but as time has gone by some absorption of the fat is evident, so that from my observation if the joint resected were adjacent to a muscle-flap, this would seem to be preferable. If, however, the joint does not have such contiguous tissue, fat can be transplanted with assurance that it will not be extruded, and will give a fairly satisfactory result. On the other hand, if the ankylosis is complicated with scar-tissue contraction of the tissues about the joint, the result is naturally affected, but in none of my cases has the ankylosis recurred, and in all but one the range of motion . . . was from 25 to 45 degrees, entirely satisfactory under the circumstances. In the case spoken of (as presenting an unsatis-

factory result) only one row of carpal bones was removed. In all the other cases both rows of bones were removed."

Fat may be transplanted into the skull for the purpose of preventing the formation of adhesions with the assurance that it will not be a cause of irritation; the epileptics on whom the author operated, so far as observed, had not been cured.

In attempting to fill in bony defects the author failed in a case of tuberculous and in one of non-tuberculous osteomyelitis, but was successful in a case of osteitis fibrosa cystica.

The remaining cases in which fat transplantation was used were contractures of the hand following extensive infections. In some of these the structures were identified with the utmost difficulty, so that the operations were long and tedious, but in all the fat, placed between the tendons and the bones, between the tendons and the skin, and between the individual tendons, so far as possible without the use of retaining sutures, lived, and the usefulness of the member was increased.

TREATMENT OF INFECTED WOUNDS BY PHYSIOLOGICAL METHODS.

WRIGHT (*Lancet*, June 17, 1916) explains in great detail the action of hypertonic solutions of sodium chloride when applied to infected wounds.

The treatment of infected wounds divides itself into three therapeutic procedures:

(*a*) The freeing of the depths of the wound from the infecting organisms, the eradication of the infiltration in the walls of the wound and of sloughs from its surface, and the inhibition of the growth of microörganisms in the cavity of the wound itself. It is also essential at this time to prevent the ingress of bacteria and septic material into the lymphatics and blood.

(*b*) The elimination of the surface infection.

(*c*) The promotion of the processes of complete repair.

The majority of the antiseptics in common use lose their antiseptic power as soon as they come in contact with albumin. Their penetrative power is therefore very small. It can be demonstrated that none of our ordinary antiseptics kill organisms enveloped in dead or living tissues, or in serous or purulent discharges; and that none diffuse into the walls of recesses of the wound.

In proper drainage there should be an outflow from the infected tissues to the external surface or the surface of a wound cavity; and secondly, where a wound cavity exists there should be a flow from that cavity to the exterior.

As ordinarily conducted, by simple incision, only the second of these requirements is met, for only when the tissues are edematous will there be a flow of lymph under such circumstances. In tissues of normal density nothing like adequate effusion will be obtained, the flow here being rapidly arrested by clotting and desiccation; and, where we are dealing with densely infiltrated tissues, incisions may fail to furnish even as much as a drop of exudation.

Saline dressings supply a means of invoking, in the infected wound, certain requisite physiological reactions. By their aid we can, while at the same time inhibiting bacterial growth, drain the tissues, resolve infiltrations, and promote the separation of sloughs—besides giving other assistance.

A concentrated salt solution will attract water; and, except in those cases in which a membrane impermeable to albumin is interposed, the outflowing current of water will carry with it the whole of the protein substances which it holds in solution. This means that hypertonic salt solution applied to tissues lying bare in the wound, or to granulating surfaces, will act as a lymphagogue drawing out from the infected tissues lymph which has spent all its antibacterial energy, and drawing into the tissues from the blood stream lymph inimical to microbic growth.

Brought into direct application upon the leucocytes a hypertonic solution (what is

in view here is a solution containing 5-per-cent sodium chloride) will disintegrate these cells, setting free the tryptic ferment they contain. Such hypertonic salt solution will also exert a number of inhibitory actions.

It will inhibit the action of the tryptic ferment set free in the wounds.

It will inhibit coagulation, and so prevent the sealing up of the orifices through which lymph pours into the wound.

It will inhibit leucocytic emigration into and prevent phagocytosis in the cavity of the wound.

It will inhibit microbic growth.

Normal solutions of sodium chloride exercise a positive chemotactic effect on white blood-corpuscles. In moderately dilute solutions (8.5 per cent) salt does not interfere with the activity of trypsin, nor does it inhibit the coagulation of blood or lymph, phagocytosis, or microbic growth.

The first requirement when we have an infected, lymph-bound, infiltrated, and sloughing wound will be to get rid of the coating of scab and fibrin adhering to its surface, and set the lymph-flow going, to resolve the infiltration and to promote the separation of the sloughs. This involves two successive operations. In the first we make use of the hypertonic solution undiluted; in the second we turn its dilution to profit.

At first the striking part will be the outpouring of lymph. But there will be at the same time, (*a*) in the depth of the tissues, (*b*) on the surface, and (*c*) in the cavity of the wound, other reactions which cannot be directly followed by the eye.

(*a*) In the depth of the tissues there will be substituted for the spent lymph which has been extracted lymph freshly drawn from the blood stream. This means that there will be substituted for a lymph which is favorable for the growth of all microbes indiscriminately a lymph which will stop the growth of serosaprophytic bacteria, and imperfect serophytes (such as the gas-gangrene bacillus); and at the same time seriously impede the growth of the serophytic bacteria, above all the growth of the streptococcus.

Further, the microbes in the tissues, which when immersed in the spent lymph were insusceptible, will, when immersed in the fresh lymph, become susceptible to phagocytosis. And in the induction of phagocytosis in the interior of the tissues the imbibed salt will, we may take it, play a contributory rôle. For we have seen that salt, appropriately diluted, stimulates leucocytic emigration.

(*b*) In the more superficial regions of the walls of the wound and the adhering sloughs the hypertonic salt solution will break down the leucocytes and set free tryptic ferment—ferment which will not come into action so long as the concentration of the salt is maintained. The coagulation of the lymph on the face of the wound will also be inhibited.

(*c*) In the cavity of the wound microbic growth will at the outset be completely arrested by the hypertonic salt, and it will, after the lymph has begun to pour out, be inhibited to different degrees according to circumstances by the combination of salt and antitryptic exudation. So long as the salt solution is maintained at full strength, both emigration into and phagocytosis in the cavity of the wound will be inhibited.

As soon as the hypertonic solution in the cavity of the wound has been sufficiently diluted by outflowing lymph, the salt diffuses out into the infiltrated walls of the wound and the sloughs; and with this the tryptic ferment previously set free comes into action, and goes about its work of "cleansing digestion." At this time the discharge becomes purulent, an indication for the redressing of the wound.

In applying hypertonic salt solution the following points must be borne in mind:

For the achievement of adequate lymphagogic effect considerable quantities of the solution must be used. The dressings ought to come directly out of the hot solution, and be applied dripping wet.

In order that a "cleansing digestion" may follow upon the lymphagogic action the

amount of salt employed must be kept within such limits as will allow its being within a reasonable period diluted by the outflowing lymph—in other words, too much of the solution must not be used, nor too concentrated a solution; nor must it be supplemented with large packs of saturated solution, nor with salt tabloids.

In order to anticipate that pullulation of microbes which will supervene when the exudate becomes tryptic the wound should be redressed as soon as the discharge begins to be purulent.

Wounds which lie wide open should be packed with gauze wet with 5-per-cent saline, and covered with some impermeable tissue. When redressed all pus must be removed before the strong salt solution is again applied. Where the wound is pocketed or tends to flap together, the best procedure is to apply a bath of warm 5-per-cent saline. Should this be impossible the wound should be irrigated at intervals. Neither the bath nor the irrigation should be continuous, intervals being allowed for "digestive cleansing." Where there is a long tubular wound, this should be syringed out with the 5-per-cent solution; a split or fenestrated tube containing a wick of gauze wet with a saturated solution of salt should then be inserted.

When gas-gangrene, streptococcic cellulitis, or other acute tissue infection is present, when there is danger of secondary hemorrhage from an infectious process near an artery, and it is therefore not wise to permit tryptic digestion, and when a joint is infected, the application of the 5-per-cent saline should be made as nearly continuous as possible, either by frequent redressing, injection of the solution through tubes inserted down to the joint surface, or by the application of compresses wet with saturated saline solution over the wound.

Redressing is called for when there is a purulent discharge, and still more urgently when the wound is "lymph-bound" and the serum ceases to flow.

All bruising, and all movement of the infected parts, both passive and active, are to be avoided to prevent the diffusion of septic elements by the lymph or blood.

Hypertonic salt is not to be used where there is oozing from an operative wound, as an amputation stump, or where the granulations are edematous, or where the granulations are a bright-red and bleed at the least touch, or after the infiltration has disappeared. Physiological saline is then indicated. This tends, by drawing the leucocytes to the surface, to destroy the serophytic organisms.

Secondary suture of the wound may be safely performed when favorable bacteriological and anatomical conditions alike exist. The bacteriological conditions may be pronounced favorable if a microscopic examination of the fluid from the depth of the wound and drawn out by a "lymph leech" is negative; or failing this, clinical evidence may show the probability of the deep infection having been gotten rid of, or when stained impression preparations made from the wound surface show that there are large numbers of well-conditioned polynuclear leucocytes and a complete absence of microbes, or only here and there a stray bacterium.

The anatomical conditions are favorable when one can without undercutting bring together the skin edges without putting too great strain on the sutures, or leaving any hollow spaces beneath. The operation should follow immediately upon the bacteriological examinations.

THE SLIDING GRAFT AND THE KANGAROO SUTURE IN FRESH FRACTURES.

LATHROP (*Annals of Surgery*, July, 1916) states that if there be deformity or overriding, either a sliding graft is put in, taken from an upper fragment, as advised by Albee, and fastened with kangaroo tendon—or the ends are put in position by means of clamps, and then fastened by two holes drilled through each fragment in such direction that, when the kangaroo tendons are passed through, they will cross each

other in the medullary canal, and when tied will hold the ends of the bone in apposition, without slipping.

In the case of an overlapping, or oblique fracture, the holes are drilled straight through, so that the gut is passed in from one side to the other, then back, and tied on the same side—a mattress suture. Two of these are sufficient. The wound is then carefully sutured, and after applying the dressings the limb is put up in plaster of Paris. This method applies chiefly to the tibia, humerus, radius, and ulna, but Lathrop has used it in several fractures of the middle third of femur.

Fractures of the radius and ulna, which are often so troublesome, are quickly repaired by a single kangaroo tendon passed through a small drill hole in each fragment, and the results are most satisfactory.

A remarkable thing about the autogenous graft is its tendency to live and grow in the presence of infection and pus. In one case after replacing (twelve days from the first insertion), and fastening with kangaroo tendon, the leg continued to drain, but the graft grew in place, and the bones united.

Lathrop has operated on 41 cases out of 103, showing a fair conservatism. In the light of his present knowledge he would have done more sutures, and thus would he have treated all of the compound fractures of the lower leg.

In view of the compensation law, now in effect, there is no doubt but what more will be demanded in the way of shorter periods of disability, and if it is shown that the cases operated upon by the Albee technique do better and are restored quicker than by other means, then the choice will be for that method, but always under strictest asepsis, and by those qualified to do it and who are in daily touch with operative technique.

In summing up, Lathrop states that from his experience in several hundred cases, during the past few years, and having used wires, plates, nails, and later the Albee methods, the latter offers by far the best means by which good results may be gotten, without resort to any foreign body. The simple method of kangaroo suture is of vast benefit in cases of fresh, overlapping, or obstinate fractures of arm, forearm, or leg; even in the shaft of the femur it can be used with success; while, if desired, the sliding inlay graft offers a method whereby success will be gotten in the majority of cases in which ordinary reduction is not satisfactory.

The *x*-ray should always be used, an anesthetic should always be given, and attempts to reduce without operation should be made; and, these failing, the open treatment by graft, or suture, is indicated.

Compound fractures can nearly always be placed in apposition and held by the kangaroo tendon. Plaster of Paris is the best means of immobilization, and should be applied smoothly, with care to pad the parts.

THE TREATMENT OF PARESIS BY INTRAVENTRICULAR INJECTIONS OF DIARSENOLIZED SERUM.

KNAPP (*Boston Medical and Surgical Journal*, July 6, 1916) contributes a paper upon this subject. He speaks, first, in commendation of the Swift-Ellis method, stating that in syphilitic affections of the central nervous system intraspinal injections of salvarsanized serum have yielded results such as in no other way has he ever obtained with such constancy. This belief is based on a study of about 500 injections on over a hundred patients, with pretty constant benefits, with no bad effects other than a temporary increase of pain, excepting for one sudden death. The most striking benefits were in the spinal cases. He has seen tabetics, who could stand only with the support of two nurses when treatment was first begun, who after a few injections would walk several miles with an approximately normal gait, and paraplegics leaving the hospital walking normally and with complete control of the bladder and with normal sensibility to reflexes after three injections. Such results he has not seen in cerebral cases.

Marinesco, Cotton, Hammond and others

are quoted as having given intraventricular injections to a number of patients with very considerable benefit and no bad results.

The operation is comparatively simple. A small trephine hole about half an inch in diameter is made just in front of the bregma and an inch to the right of the median line. The dura is then incised so as to give an opportunity to select a spot free from large cortical vessels, and a blunt-pointed cannula is inserted downward and backward about six to seven centimeters into the lateral ventricle. Hammond has usually found the dura very thick and opaque, but such has not been Knapp's experience. Ten to twenty cubic centimeters of cerebrospinal fluid is then slowly drained off and an equal amount of serum, containing 0.6 to 0.8 milligramme of salvarsan, neosalvarsan, or diarsenol, is allowed to flow in very slowly and gently. The wound is closed in the usual way. Subsequent injections are made directly through the scalp.

The first reported case was a coal-heaver of low mentality, who seemed to be somewhat bettered by two injections each of 0.6 mg. The second was a drug clerk who was noted as being "brighter" after the second injection. The return of the knee-jerk and reaction of the pupils is noted.

PRIMARY CARCINOMA OF THE URETHRA, RETENTION OF URINE FROM OBSTRUCTION, RESTORATION OF FUNCTION BY RADIUM.

SHOEMAKER (*Surgery, Gynecology, and Obstetrics,* June, 1916) quotes as follows a case reported by Lehueu and Cheron: A woman, aged twenty-six; pavement epithelioma, at first involving the urethra, which was destroyed, producing incontinence; extension to vagina. Radium applications by Cheron with disappearance of growth. Two and a half years later, death under operation for implantation of ureters into bowel. Autopsy: no microscopical malignancy.

The author then relates his own experience: Mrs. W., multipara, a full-blooded Virginia negress, aged fifty years, applied at the Presbyterian Hospital because of overdistention of the urinary bladder with complete retention. Beginning about five months before (July, 1915) there had been some difficulty in urination, gradually succeeded by dribbling. For more than a week bladder distention had been extreme, and on admission culminated in inability to pass any urine at all. There had been no bleeding or pain, except that due to the bladder condition.

No ordinary sized catheter could be introduced, owing to a nodular infiltration in and around the urethral canal. The urethra felt through the vagina like a hard fixed ridge of the size of a lead-pencil, extending from the meatus back nearly to the base of the bladder. The orifice was retracted, its edges hard, irregular, nodular, and ridge-like. The vaginal surfaces were normal in color; the surfaces of the urethral mucous membrane were reddish but not ulcerating. There was no involvement of the cervix or uterus; the vagina and vestibule showing only senile changes, except close to the urethral canal. There was no tumor. A No. 6 ureteral catheter was passed with some difficulty. It was tied in and the bladder thus gradually drained. In the first twenty-four hours, 173 ounces, or nearly 11 pints, of urine were thus obtained and some was lost.

Bladder drainage and rest in bed caused sufficient subsidence of swelling to enable a No. 12 soft catheter to be passed after some days, but retention persisted.

Surgery was inadvisable, as the removal of the entire urethra up to the neck of the bladder would have been necessary, with resulting incontinence. Radium was therefore advised. Dr. William S. Newcomet carried out this portion of the treatment, while the bladder paralysis and cystitis resulting from overdistention were being treated in Dr. Shoemaker's service at the Presbyterian Hospital.

The patient was transported to and fro, from time to time, to the Department for

Radiotherapy of the Jefferson Hospital, where an applicator of proper size and efficiency was to be found. Between December 14, 1915, and January 4, 1916, nine applications in all were made, of three hours each. The quantity used was 20 milligrammes of radium element.

TREATMENT OF WOUND INFECTIONS.

MORGAN (*Proceedings of the Royal Society of Medicine,* June, 1916) alludes to Wright's advocacy of giving up treatment by antiseptics for treatment by salt solutions. Morgan is not in accord with Wright concerning the interpretation of his laboratory work. His method of investigation was somewhat different and seems distinctly more in accordance with clinical conditions. He finds that the ultimate strength of the antiseptic being the same, the greater the proportion of pus the less the inhibition of growth. Where pus is present in the proportion of 4 parts to 1 of antiseptic, organisms may grow freely when the following are the antiseptics used: Mercuric salts 1 in 200, carbolic acid 1 in 60, iodine 1 in 200, boracic acid 1 in 20, chloramine 1 in 20, hypochlorous solution 1 in 200 available chlorine. Organisms also grow when salt solution 20 per cent is used. Since organisms grow in pus in which antiseptics are present in the strengths indicated above, it is utterly unreasonable to expect any of them to diffuse into the tissues to such an extent as to give a strength sufficient to inhibit the growth of microbes, still less to kill them. The pyogenic organisms are, as regards their growth in pus, among the least affected by the ordinary antiseptics. It is plain that in appraising the value of an antiseptic the purpose for which it is used must be taken into account. For instance, for washing out of a wound, when the antiseptic would be in great excess, hypochlorous solutions are very potent and carbolic acid is comparatively weak. On the other hand, for an application in a dressing, when the pus would tend to be in excess, hypochlorous solutions are practically useless, whilst carbolic acid, although it has the disadvantage of interfering with the activity of the leucocytes, is fairly efficient.

Again, it becomes clear that, upon the evidence the experiments supply, antiseptics cannot do as much as is claimed for them. They certainly cannot sterilize the tissues subjacent to the surface of a wound, and indeed cannot be depended upon to sterilize an accessible surface, although they kill many of the organisms on it. Their use, therefore, depends on whether there is any advantage in this. It would seem that there is, for it can hardly be possible that the depth and intensity of the tissue infection are independent of the proportion and virulence of the organisms in the surface pus. If, therefore, these can be reduced, even temporarily, without at the same time unduly interfering with physiological processes, it is an important gain. This, which is in fact the most important object in dressing wounds, can be done by means of antiseptics, and herein lies their rôle in antiseptic treatment. If we expect more from the antiseptics at present available, we shall be disappointed.

SOME STUDIES ON THE ANATOMY OF THE RENAL PELVIS.

EISENDRATH (*Urologic and Cutaneous Review,* June, 1916) notes that the subject of his paper is one of considerable importance, not only from the anatomical standpoint, but from the clinical as well. The wounding of an anomalous vessel in the performance of a pyelotomy has occasioned hemorrhage so severe as to necessitate nephrectomy.

In addition to the "high" type of retrorenal artery usually described, in which this artery after coming off from the renal trunk goes directly to the posterior aspect of the pelvis and then passes along at just about the junction of the renal pelvis and the parenchyma of the kidney, there are middle and low types, which occur in a considerable proportion of cases. In the middle type the artery passes directly across the middle

of the pelvis, and as it lies here surrounded by fat it is very likely to be injured in operative procedures on the pelvis. In the low type the artery crosses the junction of the pelvis and ureter.

Anomalies are also encountered in the course of the renal veins. Typically these all lie in front of the pelvis, but occasionally all lie behind, or branches of equal size lie both in front and behind.

In the 68 kidneys in which the author dissected the arteries, the high type was found in 56 cases, or 82 per cent; the middle type in 4 cases, or 6 per cent; and the low type in 1.5 per cent of cases. Middle and low types were combined in 4.5 per cent, high and low in 3 per cent; the artery came directly from the aorta in 1.5 per cent, and from an accessory artery in 1.5 per cent. All of the renal veins were retropelvic in 6 cases, or over 9 per cent; in one case the retropelvic vein went directly to the vena cava.

As to the type of pelvis, the author found that the ampullary type usually described occurs in 87.8 per cent of cases (157 kidneys examined). The bifid type was found in 10 per cent, and the trifid in 2 per cent.

THE COMPLUETIC REACTION IN AMENTIA.

STEPHENS (*Proceedings of the Royal Society of Medicine,* June, 1916) explains the title of his paper to the effect that his coined word "compluetic" is from the two words complement and luetic, and that by it he means the reaction commonly and to an extent unjustly, since the Bordet-Gengou are neglected, called the Wassermann reaction. He gives a summary of his technique, which seems excellent. He applied the test, and found in one hundred cases examined that 42 gave a positive reaction. Of the 42, 22 were definitely positive and 20 were weakly positive. The disease is regarded as congenital whether the patients exhibited any of the stigmata of syphilis. Nor did a study of the records of the parental and family histories adduce evidence of the disease in any of the parents or their forebears. The compluetic reaction, being the only reliable evidence in forty-two of these cases of their being syphilitic at all, was also the conclusive testimony to the presence of the disease.

Allusion is made to the cases of "infantilism," free from all obvious syphilitic stigmata, in which Mott has seen in both ovaries and testis myriad colonies of the spirochæta pallida. Similarly retarded develpoment of the other members of the endocrinic glands may be found to be due to the same cause, and how closely the endocrinic system is associated with the central nervous system is daily becoming more manifest. Broadly considered, amentia may, perhaps, be interpreted as a symptom-complex of arrested brain development, such retardation being due either to an inherent inability on the part of the brain cells to grow and evolve, or to the effects of some factor inimical to their perfect fulfilment, such a factor being either traumatic, or toxic, or inflammatory in its appearance.

In none of these forty-two cases giving a positive compluetic reaction did the syphilitic virus acting alone appear to produce the amentia. In every instance it would seem that the virus was associated with and acted upon inherently defective, diseased and degenerated, or damaged nervous tissues. And this, perhaps, is only to be expected, for, as will be recollected, the children of syphilitic parents need not necessarily be aments, although, as is also known, a minority of congenital syphilitics, if untreated, or ill-treated, are liable to become the victims of various nervous lesions under mental or physical strain and stress; and this is especially so—in fact, it may even be said to be only so—in those patients in whom the central nervous system is in some way defective. Given a healthy nervous system, congenital syphilis, as is proved by common medical experience, will not produce amentia. On the other hand it is quite possible, and even reasonable, to suppose that given an exceedingly virulent

neurotoxic type of syphilis *in utero* the healthiest nervous system would be likely to fall a victim to the virus. Between these two extremes the various grades of syphilitic amentia may be found.

The degrees of amentia are grouped as follows: idiots, imbeciles, feeble-minded, and moral imbeciles. Of all the 100 patients examined by Stephens, all were either idiots or imbeciles. Although positive reaction was found in 42 cases, in only 22 of these was a reaction to be regarded as strongly positive. If syphilis be a dominant or even an actively contributing cause of idiocy or imbecility it is highly important that this should be recognized, since it constitutes further argument for vigorous treatment of the potentially or actively pregnant woman.

Shuttleworth quotes a table of percentages obtained by fourteen different observers which varies from 1.5 to 60, in which positive reactions to the Wassermann test have been recorded in the blood of congenital cases of mental defect.

Collie has shown that over 9 per cent of males apparently healthy applying for employment in various occupations such as tramway, fire brigade, etc., gave a positive Wassermann reaction.

Plaut's observations tend to show that the reaction disappears with age. This was not evidenced in the report of Stephens.

In this connection Gordon's contribution (*Archives of Pediatrics*, 1916, xxxiii, 273) is interesting. He notes in a series of 78 cases comprising imbeciles, idiots and feeble-minded, with epilepsy, petit mal, headaches, and those without functional or organic disorders, the Wassermann test showed that 50 per cent presented a positive reaction. He notes that the mental impairment caused by syphilis is at times irremediable; it also causes mental deficiency, which is amenable to improvement. The detection of such recoverable cases is of paramount value. He advises that where a positive Wassermann is procured the treatment should be vigorous and prolonged. He records distinct improvement in feeble-minded children; diminution or cessation of epileptic attacks in some, and special betterment in the case of petit mal. The most striking is the improvement in the feeble-minded with no functional disturbance.

INDICATIONS FOR AND RESULTS OF CEREBRAL AND CEREBELLAR DECOMPRESSION IN ACUTE AND CHRONIC BRAIN DISEASE.

ELSBERG (*Surgery, Gynecology, and Obstetrics*, August, 1916) states that the first effect of a local increase of pressure is that the brain is pushed in another direction. Thus in supratentorial new growths, the hemisphere is pushed toward or away from the median line. As a result, the falx cerebri may bulge toward the other side, and the tentorium become convex toward the cerebellum. The increased pressure upon the inner surface of the skull may be followed by absorption of bone in one or another location. A certain amount of pressure is transmitted below the falx to the hemisphere of the other side; its amount will depend upon the location of the growth. From the same cause, cerebrospinal fluid is forced out of the cranial chamber into the spinal canal and along the sheaths of the cranial and spinal nerves. The stretching of the dura probably causes the headache, and possibly the nausea and vomiting; the forcing of fluid into the sheaths of the optic nerves is followed by papilloedema and choking of the disks, while the pressure upon the brain itself is followed by slowing of the pulse and respiration and interference with function. Unless the cerebral ventricles become distended by an obstruction of the iter the fluid is present in excess in the spinal canal.

If a local increase of pressure occurs underneath the tentorium, the latter is bulged upward, and secondarily the intracranial pressure is raised by the stagnation of fluid in the ventricles. The free communication between the ventricles and the subdural spaces of the brain and cord is a necessity for the proper functionating of the brain; when the cerebrospinal fluid can

no longer flow from the lateral ventricles through the Sylvian aqueduct to the fourth ventricle and the spinal canal, symptoms of increased intracranial pressure are certain to appear.

If the increase of intracranial pressure is due to a dilatation of the ventricles, from compression of or adhesions in the iter (obstructive hydrocephalus), from an oversecretion of cerebrospinal fluid or diminished absorption from the subarachnoid space (non-obstructive hydrocephalus), then the pressure will be exerted upon all parts of the brain; although some parts, either on account of a more exposed position or greater delicacy of structure or greater sensitiveness, are more easily affected than others.

The symptoms of increased intracranial pressure are then either local, due to a direct effect upon parts of the brain whose functions are interfered with, or general. Local symptoms are, however, often due to general causes and general symptoms are often caused by a strictly local process. Certain focal symptoms such as abducens palsy and nystagmus are often observed in a generalized increase of tension, and the frequency of cerebellar symptoms in internal hydrocephalus is well known.

A localized expanding lesion such as a tumor or hemorrhage may first cause focal symptoms, followed by symptoms of pressure on more distant parts of the brain, and finally general symptoms such as loss of consciousness, headache, papilloedema, etc. The progression of symptoms may not occur in such a regular order. The general may appear long before the localizing symptoms, and it is often necessary to operate for the relief of the general symptoms before any localizing ones have shown themselves.

The means at our command for diminishing increased intracranial pressure consists either in the removal of fluid by spinal or ventricular puncture (including puncture of the corpus callosum), or the making of an opening in the skull to give the brain a chance to bulge out through the opening, thus making what really amounts to an enlargement of the cranial cavity.

If the increase of intracranial pressure is due in part, even if only secondarily, to an increase of fluid within the ventricles, the repeated removal of the fluid by lumbar puncture may be a valuable decompressive method. To have any real effect, it is necessary that the communication between the brain cavities and the spinal subdural space be wide open. If this is the case, the removal of 20 to 50 cubic centimeters of fluid at regular intervals will relieve the compression of the brain to the extent that the compression was due to the fluid. The same can be accomplished by repeated ventricular punctures in infants and young children. Statistics have shown that fully 75 per cent of tumors of the brain are accompanied by more or less internal hydrocephalus, so that in irremovable or unlocalized new-growths, except those in the posterior cranial fossa, some relief of the compressed brain will follow the withdrawal of fluid from the spinal canal. Where the increase of pressure is due to an oversecretion of fluid or a diminished absorption from the subarachnoid space, repeated lumbar punctures may be of benefit. If the distention of the ventricles is due to an obstruction of the aqueduct of Sylvius by adhesions, the usual form of primary obstructive hydrocephalus, a new communication may be made between the ventricles and the cerebral subarachnoid space by means of puncture of the corpus callosum. This is a most valuable decompressive operation in all forms of obstructive hydrocephalus, whether due to new growth or other cause. The investigations of Dandy and Blackfan have shown, however, that it is always necessary to test the absorptive power of the subarachnoid space by means of intraspinal or intracranial injections of neutral phenolsulphonephthalein. If the absorption from the subarachnoid space is far below the normal, there is no use of performing a callosal puncture because the fluid cannot be absorbed, and instead of an internal hydrocephalus there

would result a combined internal and external hydrocephalus with the same total amount of pressure upon the brain tissue.

Puncture of the corpus callosum is a rational and valuable decompressive method in brain tumors with internal hydrocephalus; it may be done alone or in conjunction with a decompressive craniotomy.

The best decompression will be the one in which the brain tissue is dragged upon or pushed in such a way that the smallest number of nerve tracts are interfered with. The author has examined the brains of a number of patients who have died from irremovable brain tumor and on whom a palliative subtemporal decompression had been done. In supratentorial lesions there was often considerable internal hydrocephalus, and the distended lateral ventricle of the side operated on was dragged upon or distorted. Much harm was done to important nerve tracts by this unnecessary distortion of the brain, and just as much space would often have been gained, and mechanically a more correct decompression have been accomplished, by means of an autodrainage of the ventricles. Motor-tract symptoms are apt to be made worse in a left or right mid-brain tumor by a subtemporal decompression on the right side. The symptoms of a tumor which lies medianward to the internal capsule may be exaggerated by a subtemporal decompression. In these two classes of cases it is advisable to do a bilateral decompression, the right side being done first and the ventricle punctured, so as to avoid too great a prolapse of the left temporal lobe and a resulting aphasia.

The incision of the capsule of a large irremovable tumor in the cerebellopontine angle and the curetting away of part of the tumor after a large bilateral suboccipital craniotomy has been done is also a decompression. These tumors in the cerebellopontine angle are benign in character, are encapsulated, and grow very slowly. Small tumors can be removed with relatively small danger. Many of the growths are very large when they finally come to operation and markedly compress the pons and medulla, so that even with the greatest care considerable trauma to those important structures is bound to occur. It is therefore preferable to relieve the pressure by incising the capsule of the tumor and scraping out part of the growth, and this will often be followed by complete disappearance of the symptoms. If the symptoms should recur, the procedure can be repeated after a few years.

In removable growths there is often an advantage in diminishing extreme intracranial pressure by a ventricular puncture, a puncture of the corpus callosum, or a subtemporal decompression before the actual removal of the growth is attempted.

It is rarely possible to revive a patient who is in deep coma from a brain tumor by any kind of an operation unless the coma is due to the distention of the ventricles. Therefore, if the neurologist sees a patient with a brain tumor in coma, he should recommend a rapid aspiration of the ventricle or a puncture of the corpus callosum, perhaps with a subtemporal decompression. If there is not a decided increase of fluid in the ventricles, the chances for return to consciousness are slight.

Whether a decompressive operation can really relieve a spastic paralysis (as occurs in Little's disease or in posthemiplegic spasticity), unless an actual cystic collection of fluid is found, is still an open question. Sharpe claims to have obtained some good results from decompression in Little's disease, and he has shown a number of remarkable cases. If further experience will substantiate the results thus far obtained, a great advance in the treatment of Little's disease has been made by Sharpe.

The indications for operative interference in fracture of the skull should be based upon the diagnosis of the condition present in the individual case, and upon the question whether there is a stationary or an advancing lesion. The fact that the patient is drowsy or in a stupor is not of itself an indication for operation, for an individual with so-called cerebral concussion without

bony fracture or gross injury to the brain may remain in a stuporous condition for many hours. It is a different matter if the stupor becomes deeper and if more evidence of increased intracranial pressure appears.

If the symptoms show a tendency to progress and are well localized to one part of the brain, the surgeon may be in doubt whether there is increasing extradural or intradural hemorrhage. An exploratory puncture of the skull may then have to be done, and it can often be accomplished under local anesthesia.

Patients in whom few symptoms are present at first, but who develop after a few days signs of increased intracranial pressure, papilloedema, drowsiness, respiratory disturbances, and slow pulse, are suffering from a slow venous hemorrhage or from edema of contused brain tissue. If the signs point to a localization of the compression of the brain, an exploratory trephining must be done over that region; otherwise a subtemporal decompression is indicated.

Patients with the signs of fracture of the base, and of increasing intracranial pressure, should have a subtemporal decompression performed.

THYMUS DEATH.

Under this title FALLS (*Surgery, Gynecology, and Obstetrics,* June, 1916) writes on a subject which is always of vivid interest to both the internist and the surgeon. The gland develops as a paired organ from the ventral part of the third bronchial cleft. These unite early in the embryological development, and at birth the thymus lies in the superior and anterior mediastinum, extending downward as far as the fourth costal cartilage, and lying on the surface of the pericardium and superficial to the innominate veins. It varies greatly in size, shape, and position. Experimental work seems to show that this gland is intimately concerned in calcium metabolism, this effect being particularly marked in the early weeks of life.

Koenig removed the thymus from a nine months old child, which subsequently became rigid. Thymus death may be grouped in two great classes, to wit: under status thymicus, and under status thymicolymphaticus, in which the thymus gland is greatly hyperplastic and gives clinical and anatomical evidence of compression of the great vessels, nerves, and trachea. It has apparently been shown that in certain cases compression of the great vessels is an important factor in the cause of death. Status thymicolymphaticus implies an enlarged thymus associated with a general enlargement of the lymphatic and frequently of the ductless tissues. Another very important finding in these conditions, according to Wiesel and Hedinger, is an associated hyperplasia of the chromaffin tissue of the body. There is also an associated narrowing of the vascular system in these cases. There is evidence to show that the thymus plays an important part in Graves's disease, and may in certain cases even play the title rôle. The result of feeding tadpoles on thymus is interesting and suggestive. They grow enormously and do not change form. Those fed on thyroid, however, change form very rapidly, but do not grow. Falta states that the thymus has supernormal parenchymal value in many cases of Basedow's disease, also in acromegaly, in hypophysial dystrophy, in myxedema, in eunuchism, etc. It is a familial disease characterized by the death of the children in a family with the classical symptom-complex of hyperplasia of the thymus.

The symptoms in this condition are those referable to an enlarged thymus causing pressure upon the mediastinal structures with or without the associated changes found in status lymphaticus, according to whether the condition is a status lymphaticus, with especially large thymus, or a pure status thymicus.

The onset varies in different cases. Symptoms may be present at or shortly after birth, and usually appear during the first year. They may appear suddenly in a previously apparently normal child, or

gradually and with increasing severity. The cases of sudden death without any premonitory symptoms are usually cases of status lymphaticus plus thymus hyperplasia.

The symptoms referable to the enlarged gland are: Dyspnea, either constant or paroxysmal, usually aggravated by exertion, such as crying, fits of anger, sudden retraction of the head, or in association with attacks of acute infectious diseases, especially diphtheria. Cyanosis, which is usually associated with the dyspnea and is likewise paroxysmal, and is partly due to the narrowing of the air-passages, pressure on the vagus nerves and on the heart and great vessels; this may be the only symptom giving rise to the "forme cyanotique" of Marfan. Tumor appearing in the suprasternal notch on strong expiration and disappearing on inspiration. Slow pulse in some cases, probably due to pressure stimulation of the vagus nerve. Changes in the voice, which vary from a slight and transient hoarseness to a complete aphonia, due in some cases to pressure on the trachea and larynx, and in others to pressure on the recurrent laryngeal nerves. Dysphagia may in extreme cases completely prevent swallowing.

Inspiration and expiration may be prolonged and deepened, and auscultatory findings of a capillary bronchitis are common. which may go on to a bronchopneumonia, especially in the late stages of the fatal cases. Percussion may reveal a movable tumor behind the sternum, but results obtained by this method are not very reliable, as pointed out by Park and McGuire. Radiograms may show a shadow in the region of the thymus which blends with that of the upper border of the heart. The gland may be palpated in the suprasternal notch on expiration in some cases.

There may be a lymphocytosis, which is usually of the small mononuclear type and may reach 50 or 60 per cent. Eosinophilia in slight degree (2 to 4 per cent) is noted in some cases. According to Qiesel this finding is absent in the cases of pure status thymicus.

In the cases associated with the typical status lymphaticus, the above symptoms may be displayed, but usually are present in less degree, and the predominant feature of these cases is the picture of status lymphaticus with the enlargement of the lymphatic structures of the whole body, pasty skin, adiposity, and associated changes in the chromaffin system. These are the cases particularly in which sudden death occurs without prodromes.

Of special interest is the warning of Klose and others against prolonged exposure of the thymic region in young children to the x-ray because of the destruction of thymic tissue by the irradiation.

The treatment of the condition is removal of part of the gland in the cases in which pressure causing tracheostenosis threatens life. This can be accomplished by entering the thorax above the suprasternal notch, under local or general anesthesia, according to the demands of the individual case. Care must be taken not to remove the whole gland in very young children because of the metabolic disturbances engendered, as in the case of Koenig, and as shown by the experimental work of Klose and Vogt.

Irradiation with the x-ray has been tried by Friedlander, Mayers, Halstead, Ribideau, Rachford, and with some success. Its use should be restricted to older children and adults for the reasons mentioned above.

No uniform results have been obtained from treating these cases with thyroid extract and thymus tissue. Spontaneous recovery occurs not infrequently even after several attacks of dyspnea extending over years.

Care must be exercised in operating on cases showing evidence of status lymphaticus as well as enlarged thymus, as it is in these cases that sudden death during narcosis so frequently occurs.

Also as illustrated by the case reported, surgeons should keep in mind the possible anomalous position of the mediastinal bloodvessels with a view to avoiding injury to the same with serious consequences.

REVIEWS.

THE PRINCIPLES OF DIAGNOSIS AND TREATMENT IN HEART AFFECTIONS. By Sir James Mackenzie, M.D., F.R.S., F.R.C.P. Oxford University Press, London and New York, 1916. Price $2.50.

The name of Mackenzie is so intimately associated with the study of cardiac disorders that anything that he writes in regard to this subject at once receives the attention of the profession. The contents of this book were prepared as lectures to be delivered to the postgraduate students and workers in the Cardiac Department of the London Hospital, but the outbreak of the great war prevented their delivery. It is hardly necessary to state that Dr. Mackenzie believes not only that a large amount of the information herein contained has been obtained by means of various mechanical aids to diagnosis, but that these aids are essential in many instances for satisfactory treatment.

Some of the most interesting chapters, of which there are twenty-six, deal with Various Forms of Breathlessness; The Objective Signs of Heart Failure; Various Types of Murmurs and Heart Irregularities. There is also one which discusses the always important and interesting problem of Blood-pressure, and it is interesting to note that the author apparently attaches much less importance to the study of blood-pressure than many of his contemporaries. This is illustrated by the subheadings in the chapter dealing with this subject. The first of these subheadings is: "Blood-pressure Records are Used for Purposes They Cannot Fulfil;" the second, "The Research into the Significance of Blood-pressure has Not Been Undertaken by Observers Who have the Appropriate Opportunity." Again, "Up to the Present Blood-pressure Observations have Yielded but Little Information of Real Value." And still another heading is "Blood-pressure Should Never of Itself Form a Basis of an Opinion."

We presume that it is one of the unavoidable results of popularity and success that an investigator and writer comes to the conclusion that it is proper for him to make sweeping assertions in dogmatic phrases. This fault, if it is such, has become increasingly evident in Dr. Mackenzie's more recent contributions to medical literature. Doubtless many false interpretations have been reached from blood-pressure findings, but to speak of blood-pressure in the manner used by Dr. Mackenzie will not increase confidence in the views which he expresses in his writings. He makes one feel that if he is so dogmatic in regard to some matters in which he appears to know less than most of us, he may be in error in regard to the study of cardiac disease.

UNIVERSAL MILITARY EDUCATION AND SERVICE. The Swiss System for the United States. By Lucien Howe, M.D. G. P. Putnam's Sons, New York, 1916.

Dr. Lucien Howe is well known because of the excellent work which he has done toward the prevention of blindness, and he, apparently, has now turned his attention to the cure of that form of blindness in which the individual cannot see the danger which threatens him and the country in which he lives. The author's excuse as a medical man for meddling, to use his term, with military matters is that for many years he has been greatly interested in improving the physique of pupils in schools and colleges, and this led him to the studies of the methods which were employed by foreign powers for the physical betterment of their young men in order that they might be adequately equipped when the days of war arose. In other words, the author has been instigated to prepare this little work as a means of showing how much good military training can do for the physique of the young. Dr. Howe deals, first of all, with the question "Why Should There be any Preparation?" and gives the reasons which answer this question. He then discusses What is Needful in the Way of Preparation, How We Shall Prepare, The Swiss and Australian Systems of Physical Mili-

tary Education, and then goes on to a Consideration of Military Education Already Begun in This Country Outside of the Regular Service. He discusses the Advantages of Universal Military Education to the Nation and to the Individual, and includes a chapter upon Military Education, Not Training, for Girls. In other words, in much the same way that Dr. Howe has carried out his crusade against blindness, in the ordinary use of that term, he is now not only attempting to cure national blindness, but to point out how, as soon as the scales fall from our eyes, we will clearly see the benefits to be derived from training the whole body, individual and politic, for the exigencies of life.

A PURIN-FREE DIETARY. By Edna Alice Waite and Robert Ellsworth Peck, M.D. Published by Elm City Private Hospital, New Haven, Conn., 1916. Price 25 cents.

In these days when it is fashionable to attribute a very large number of symptoms to what is popularly known as gout, physicians are often at a loss to recall those foodstuffs which the physiological chemist has shown to contain an excess of purin bodies. This little paper book contains three parts: One, A Purin-free Diet List; Two, Sample Menus from which Purin-free Diets may be Made Up; and Three, A Series of Recipes with which the palate of the gouty can be pleased without insult to his metabolism.

INTERNATIONAL CLINICS. A Quarterly. By Leading Members of the Medical Profession. Edited by H. R. M. Landis, M.D. Volume III, 1916. J. B. Lippincott Company, Philadelphia, 1916.

The departments considered in this issue of International Clinics are Treatment; including Gonorrhea, the Treatment of Obesity, and the Medical Uses of High-frequency Currents. This is followed by seven articles dealing with various aspects of Diagnosis; with one upon Pediatrics; two upon Dermatology; one upon Psychiatry; five dealing with Surgical Subjects; and, last of all, an Historical Contribution on Armand Trousseau.

PHYSIOLOGICAL CHEMISTRY. A Text-book and Manual for Students. By Albert P. Mathews, Ph.D. Second Edition. Illustrated. William Wood & Co., New York, 1916. Price $4.25.

The speedy appearance of the second edition of Dr. Mathews's book, the first of which appeared just thirteen months ago, proves that our favorable comment upon it was justified and that it has met the needs not only of students but also of graduate workers in this department. It is interesting to note that the first edition was reprinted on two occasions to meet the demands of the market. The book is not materially changed, indeed, it could not be if the first edition represented as well as it did the physiological chemistry of 1915, but the author has taken the opportunity to correct mistakes, typographical and otherwise, which are unavoidable in the preparation of a first edition, has made directions as to tests and experiments more clear and practical, and has thereby brought the book thoroughly up to date.

It is a noteworthy fact that this book is not a mere series of tests and chemical formulæ, but deals with the functions of organs, and then with the products which they secrete or excrete. This is one of the reasons why it is valuable and interesting to the ordinary medical man as well as to the physiological chemist.

DISEASES OF CHILDREN. By Edwin E. Graham, A.B., M.D. Illustrated. Lea & Febiger, Philadelphia, 1916.

Dr. Graham, who is the Professor of Diseases of Children in the Jefferson Medical College of Philadelphia, has long been engaged in the teaching of this important department of medicine, and for a number of years has been bringing together facts which he has culled from his own experience and from literature for the preparation of this volume, which is quite a notable addition to pediatric literature, covering nine hundred pages. Like most books dealing with the diseases of children it is in some respects equivalent to a work upon the practice of medicine, with special reference to patients below the age of puberty. Naturally, the opening chapters deal with

The Normal Infant at Birth; with the Normal Development of the Child; with The Clinical Examination of Sick Children; and with the consideration of Infant Mortality and Heredity. Beginning with Chapter VI he discusses Congenital Malformations, and proceeds in Chapter VII to a consideration of Diseases of the New-born. After this there are chapters upon Infant Feeding; Normal Digestion; Fresh Air in the Treatment of Disease; Dentition; Disorders of Nutrition; and then, because of its importance, a long and exhaustive chapter of practically two hundred pages upon Diseases of the Gastrointestinal Tract. Fifty-three pages are devoted to Diseases of the Respiratory Tract; forty-seven to Diseases of the Heart and Blood. Then follow chapters upon the Ductless Glands, the Bones and Joints; the Organs of Speech; Diseases of the Skin; the Specific Infectious Diseases and Diseases of the Nervous System. The final chapter, XXVI, deals with Puberty. A very considerable number of original illustrations are found throughout the volume.

The book may be said to well represent our present knowledge in regard to diseases of children, and we have no doubt that it will prove a popular contribution to the subject to practitioners and students.

THE HOME CARE OF CONSUMPTIVES. By Roy L. French, M.A. Illustrated. G. P. Putnam's Sons, New York, 1916. Price $1.

The author of this book, a social worker and not a graduate in medicine, was at one time Secretary to the Kentucky Tuberculosis Commission. In carrying out the functions of his office he visited and studied many institutions, clinics, and open-air schools designed for the treatment of the tuberculous. His object in preparing the text of this small volume has been not to present medical men with facts with which they are unacquainted, but to discuss the subject more from the standpoint of the patient. There are thirty chapters, most of which are very brief. After discussing the subjects, What is Tuberculosis? The Relation of the Patient and the Physician, and Medicinal and Climatic Cures, he goes on to consider the Methods of Spreading the Infection, and then follows with chapters upon The Value of Fresh Air, Disinfection, Graduated Exercises, Marriage, Parenthood, and Tuberculosis; and in the twenty-eighth chapter answers, and answers well, the question, "Is the Fight Worth While?" Of course, the answer is in the affirmative. Fortunately, tuberculosis is a disease characterized by optimism on the part of the patient, and, therefore, most sufferers from this malady will agree that the fight is worth while, be the result what it may.

OBSTETRICS, NORMAL AND OPERATIVE. By George Peaslee Shears, B.S., M.D. Illustrated. J. B. Lippincott Company, Philadelphia and London, 1916.

The author believing that most obstetric works contain too much irrelevant matter, such as extensive discussion on developmental anomalies and fetal monstrosities, has omitted the traditional section on Embryology, the customary discussion of Anatomy, and even an extensive review of Physiology, and has gone straight to the matter in hand by dealing, first with Labor, Pregnancy, and the Puerperium; next with the Diagnosis of the Phenomena of Pregnancy, the Management of Pregnancy, the Antepartum Examination, the Fetus in Utero, the Physiology and Mechanism of Labor; the Diagnosis and Clinical Phenomena of Labor: its Management; Physiology and Clinical History of the Puerperium: its Management; and Multiple Pregnancy in Labor.

The second part of the book is devoted to the Pathology of Pregnancy and Labor; the third to Obstetric Surgery, including the General Technic of Obstetric Operations; The Procedures Designed to Overcome the Resistance of the Cervix; The Induction of Abortion and of Premature Labor; The Forceps; Version; The Cæsarian Section; Symphysiotomy and Pubiotomy and Embryotomy.

The fourth part is devoted to the Pathology of the Puerperium, and includes Puerperal Infection, Infection of the Breast

and Nipples, and other Complications of the Puerperium, such as Subinvolution; Uterine Displacements; Puerperal Psychosis; Postpartum Paralysis and Puerperal Myalgia.

Throughout, the work is characterized by a certain earnest insistence upon attention to those many details upon which the safety, indeed the life, of the mother so often depend.

The book is essentially practical. It is admirably illustrated, and in its 700 odd pages covers the subject extraordinarily well. The author is in the habit of summing up his chapters in a few sentences so clearly expressed as to make a permanent impression on the memory. Perhaps the key-note of the book is the minute attention to detail and the scrupulous consideration of the best interests of the mother.

DIAGNOSIS AND TREATMENT OF SURGICAL DISEASES OF THE SPINAL CORD AND ITS MEMBRANES. By Charles A. Elsberg, M.D., F.A.C.S. Illustrated. W. B. Saunders Company, Philadelphia and London, 1916.

This present volume is in the main a record of the author's personal experience in the surgical treatment of diseases and injuries of the spinal cord and its adnexa, and includes, as is proper, much that has been learned from others. It is confined rather strictly to a consideration of the diagnosis and treatment of diseases of the spinal cord that may require surgical interference, and necessarily includes a certain amount of neurology. Hematomyelia and spinal gliosis are considered because the author believes that in these diseases much harm is done to the fiber tracts by compression, and the relief of this compression by surgical means has resulted in marked improvement in a number of patients; moreover, that the time is at hand when selected cases will be regularly subjected to operative interference.

The first chapter is devoted to The Surgical Anatomy of the Vertebral Column and Spinal Cord. Thereafter follow chapters on Physiology, Localization, Symptomatology, and Methods of Examination. There is a section devoted to *X*-Ray in Spinal Disease; one on Operative Technic of the Various Surgical Procedures, with the Indications and the Various Contraindications therefor. Recent injuries are discussed; tumors receive very full consideration. Inflammatory Diseases are briefly covered, and the book closes with chapters on Complications of Pott's Disease, and on the Acute and Chronic Bone Infections and Dystrophies, including Typhoid and Railway Spine.

The book is issued in Saunders's best style, with admirable illustrations, and is characterized by a judgment and by a sense of proportion from the surgical standpoint most gratifying to the clinician who wishes to deal intelligently with this class of cases.

As a text-book for one who wants to prepare for an academic test it would be serviceable. As a guide in treating cases according to the latest concepts it is invaluable.

FIRST AID IN EMERGENCIES. By E. L. Eliason, A.B., M.D. J. B. Lippincott Company, Philadelphia and London, 1916.

This admirable book is offered the public, not as a technical and scientific treatise on the subjects handled, but as a help to humanity in general to meet and treat the emergencies which arise in every-day life. It is written for the laity, firemen, police, life-guards, boy scouts, explorers, factory workers, etc. It is so systematically arranged and clearly expressed that it should be largely helpful in public and private school education.

After a chapter on General Considerations, the general symptoms of common emergencies, and transportation of patients, there is a discussion of Surgical Principles and Supplies, including Application of Bandages.

Thereafter are taken up in turn Wounds, Hemorrhage, Heat and Cold Effects, Sprains, Dislocations and Fractures, Unconscious Conditions not Fits or Convulsions, Suffocation, Poisons, and Medical Emergencies.

The book is characterized by sound common sense and a sense of proportion.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

This month there is again a complete dearth of medical news to record. The weather conditions, after setting in promisingly last month for harvest, fell off considerably, and continued unfavorable up till the middle of the present month, and as a result a fair quantity of corn still remains to be got up. One great advantage of the weather is that there has not been any epidemic of infantile diarrhea in London.

Popular interest has been aroused by the statement of Sir George Newman, who is the chief medical officer of the Board of Education, that there are at least a million children of school age who are so mentally or physically affected or disabled as to be unable to derive benefit from the education which the State provides, and a quarter of this million are seriously crippled, invalided, or disabled. The circumstances of the present time have naturally enhanced the interest in this problem, as it is of course most important for the nation to raise as many healthy children as possible to replace the men who are falling in this war. Compulsory education of an elementary character has been in force in this country for over forty years, but it is only in the last decade that a serious attempt has been made to cope with the diseases incident to early childhood under a system more or less of compulsion. At the present time there is no compulsion on the parent who has a child suffering from adenoids, defective vision, and so forth to have the child attended to, but the moral pressure exerted is fairly great, and the reiteration of the advice given seldom fails to produce an appropriate result.

Medical inspection of schoolchildren is now universal in this country, but as the children do not commence to attend school until five or six years of age, the important time of two to five years does not come under this scheme. The recognition of this fact has promptly led to investigations as regards unhealthy maternity and infancy, and to an examination into the conditions of home which are not desirable. In the past two or three years inquiries have been instituted into the causes of premature birth and of the early death of infants, and the results when published will probably show that the number of deaths attributable to congenital syphilis has been much overestimated in the past, but that conditions influencing the health of the mother are of considerably more importance than has hitherto been realized. This is bound to lead to a closer study of the home life and environment of the mother and child. The faults which are found to be prevalent are only to be remedied by educating the parents and by remedying the defects. Centers have already been established for giving advice to the parents, or to which they can bring their children exhibiting minor ailments, whilst in certain areas free meals are provided for the parents in a similar manner to those which have been for some considerable time instituted for feeding the children. Most of such schemes have been supported by those who are charitably disposed, the actual work having been done by a body of men and women whose services have not only not been paid for, but have been largely allowed to pass unrecognized. Such a state of affairs it is now recognized must be altered, and the State must itself take this important subject in hand and not leave such schemes to haphazard and charity. It must coördinate the whole system whatever the cost, in order that we may have a healthy set of children to continue the race and uphold the traditions which have grown up in this country.

The other night London was visited by hostile airships. Somewhere about midnight the sounds of gun-firing were audible, and on looking out of the window we were fortunate enough to get a good view of the Zeppelin, which was freely focused by the

search-lights and around which the shells were exploding. It was evidently some way off, appeared about a foot long, and was making in a northerly direction. While in view it was seen to make movements corresponding to the lower part of the figure of eight, and on completing the evolution continued its former direction until lost from view, owing to the intervention of the surrounding houses. The search-lights were suddenly turned off and the gun-fire ceased. We then got back to bed, but in about twenty minutes were again disturbed, and on this occasion the sound of propellers was very audible, apparently being almost above us, but no airship could be seen. The sounds were intermittent: evidently the engine was shut off from time to time. During a longer pause we got back to bed again, and there followed an interval of quiet succeeded by a number of dull explosions seven or eight in number, after which the sounds ceased and the rest of the night was undisturbed.

During the second period, that in which the sound of propellers was audible, but nothing was seen, there was suddenly a red glow in the sky, the origin of which was concealed by the houses, and which lasted apparently thirty seconds and then died away. This was in all probability produced by the Zeppelin catching fire and ending with its destruction. Those who were in the upper bedrooms and could see over the roofs of the houses, stated that they could see the origin of the blaze, which was a good distance from the earth, but unfortunately the houses intervened and I could only see the reflection in the sky. Such is a brief description of what happens in a place of safety, but the conditions are very different when the house happens to be in the direct line of flight of the Zeppelin, when, although a much clearer view is obtained, there is considerable risk from falling shrapnel and from the dropping of bombs. It is easy to distinguish the gun-fire from the dropping of bombs, as the explosion produced by the latter is a dull thudding noise, whereas the gun-fire produces a short, sharp report. As in former air raids, the greater loss of life is amongst those who went out into the streets to see what was happening, and stress is laid by the coroners and authorities in general on this fact. People are most urgently advised to remain indoors, but apparently the interest in watching the proceedings appears to outweigh the appreciation of the danger arising to those who leave their houses.

It is rather an uncanny sensation to hear people talking all around, and yet see nobody in the streets, also to hear the sounds of distant cheering following the destruction of the airship. The people who seem to take no notice of air raids are the cabmen and the street-sweepers. The cabmen continue driving, and at least one hansom cab passed up the street during the raid, though of course we were far removed from any source of danger from the Zeppelin seen. Similarly the street-sweeper does not discontinue his occupation. The local regulations in London are not nearly so strict as in some towns, where it is punishable to strike a match when the streets are darkened, and where on the notification of the approach of an air raider all the lights are turned out, the motor vehicles ordered to proceed at once to their depots, and the cyclists even with their lights shaded are not allowed to ride, but must proceed home on foot. It is stated that in the dark the lighting of a match can be seen for half a mile, so that these regulations are perhaps not unnecessary. In London, however, the motor cars and trams do not discontinue running and the lights are not turned out.

Although medical men are doing their best to keep up the practices of those who have joined the forces, it is only to be expected that those who are absent will suffer, and the receipts from their practices will fall off. However well intentioned the neighboring practitioners may be this is bound to happen, especially in this country where a man's work is so largely dependent on his personality. To those who are employed in the R. A. M. C. and consequently are away from their practices for a long

time, the rent of their private houses is a considerable item. The special act which was passed at the beginning of the war allowing leases to be broken, has come in very usefully to some of these practitioners. Only recently a doctor was able under this act to terminate a lease, with fourteen years to run, of the house in which he was practicing. He had found that during his absence the receipts from his practice had fallen off to such an extent that it was not at all worth his while to retain his house with a view to returning to his practice in the future. An offer was made, which proved quite satisfactory to the landlord, and no objection was made to the contract being cancelled.

The report issued on the health of London during the past year does not compare favorably with that of former years. There is an increase of deaths in the aged, which is attributed to influenza and respiratory diseases occurring during the winter months. As against this, however, it is to be recorded that the number of marriages in the London district are the highest ever registered. Taking the population of four and a half million, the marriage rate is 25.9 per mille, which is a record. A slight annual increase since the year 1908 has occurred, but the increase of 1915 is to be directly attributed to the war. Probably a certain number of marriages took place under the impression that married men were not likely to be called up so soon as the single, and this impression prevailed until late into the autumn of that year. The birth-rate, however, is not so satisfactory. In 1909 to 1913 it was 25, in 1914 it was 24.3, and in 1915 it was 23.6. The medical officer in his report attributed this reduction to the moral tone of the community, but against this it must be realized that the fall of the birth-rate is wide-spread throughout nearly the whole of Europe.

We regret to have to record the deaths of several eminent medical men. Sir Victor Horsley died in Mesopotamia from heat-stroke, while Sir James Goodhart and Sir Lauder Brunton both died at a good old age in this country, and both of them after illnesses of some little duration. Their reputation is such as to need no comment.

TINCTURE OF IODINE FOR RINGWORM.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: In the THERAPEUTIC GAZETTE published under date of August 15, 1916, and beginning on page 592, is an article entitled "Ringworm of the Hands and Feet." On page 593 the writer states: "The mechanical removal of the superficial layers of the skin is an important part of the treatment. This is well accomplished by soaking and then scrubbing with a moistened cake of pumice stone or coarse sand soap."

For the benefit of the readers of the THERAPEUTIC GAZETTE I wish to state that my experience in the treatment of ringworm has disproved the efficacy of the treatment as above quoted. In treating twenty-one cases of ringworm in the past twelve months—having for their location the scalp and feet, one case each; face, five cases; neck, four cases, one of which affected one ear; and ten cases affecting the hands and wrists—complete recovery was secured within from three to seven days by applying once daily the undiluted tincture iodine, U. S. P. (Eighth Revision), alcohol 93 per cent. In not one case was this treatment followed by a dermatitis. In every case the iodine was applied freely, after which the patient was admonished to see to it that no clothing came into contact with the painted surface; this to prevent irritation. There were no dressings applied. Several of the cases cited, affecting the hands, neck, and face, were multiple infections. Very respectfully,

H. V. HAILMAN,
Physician U. S. Indian Service.

GOTEBO, OKLAHOMA.

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ORIGINAL COMMUNICATIONS.

SACROILIAC RELAXATION OR SEPARATION.[1]

BY J. TORRANCE RUGH, M.D.,

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The possibility of trouble with the sacroiliac joint other than some of the well-known infections and destructive conditions has been recognized for but a few years, yet the popularity of the idea of a dislocation or displacement as a cause of pain and disability has given very wide publicity to this condition. The laity feel that they can understand just what has happened when such a diagnosis is made, and the promulgations of the mechanotherapists and other cults have made it extremely popular, as all conditions of pain in that region are unhesitatingly ascribed to trouble in this or neighboring articulations. Formerly, this was considered a fixed joint or synchondrosis and capable of no movement unless divulsed by severe injury. Latterly, however, certain exceptions have been noted, and occasionally motion is seen either as a normal condition or as the result of injury, strain, or general muscle and ligamentous softening or relaxation. When a sudden severe or unusual movement of the trunk occurs, the force may locate in this joint and either tear the retaining structures or stretch them so as to allow a change in surface relations. Any posture or condition which throws strain on this part may precipitate an attack. Asymmetry of the legs, tilting of the pelvis from various causes, and occupation which necessitates an abnormal posture may prove exciting or predisposing causes to the onset of this condition. There is disability, with pain localized over this part. The pain may also radiate to the lumbar region, to the sides of the pelvis, and down the legs in the sciatic nerve. Tenderness will be found in some instances over the joint, and certain movements of the legs causing strain on the pelvis will aggravate the pain. The onset is usually sudden and the pain rather severe. After an operation where the body has been in a constrained posture or the lumbar spine has been unsupported upon the table, such a strain may follow and prove extremely troublesome to the patient.

The diagnosis formerly made in these cases was lumbago, but the public is becoming awakened to the actual conditions which may be present, and we shall probably soon hear everything occurring in this region called, by the laity, dislocation of the sacroiliac joint.

Two features of this trouble are of especial importance to the railroad surgeon. These are, first, the accurate recognition of the lesion as affecting the economic position and efficiency of the employee; and second, the medicolegal aspect as affecting the employee or the victim of an accident or injury. In either instance the true condition must be recognized. Naturally we turn to the *x*-ray for our diagnosis. Here we are very likely to meet with disappointment because of the difficulty of reading the plates. It is very seldom that a separation, relaxation, or alteration of relations can be observed in these cases in the *x*-ray plate,

[1] Read before the Baltimore and Ohio Surgeons' Association, June 8, 1916.

though I have very frequently heard such a diagnosis made by the roentgenologist when there were no symptoms present. Further, I have heard physicians in court testify that such a condition was present when the patient has shown no evidence of it. The clinical picture is fairly clear-cut, with a history of sudden onset, severe disability, tilting of the body to the sound side, pain in the lower part of the back, in the articulation, and sometimes referred along the course of some of the branches of the sacral plexus which pass across the front of the joint, perchance a slight swelling over the joint if the superficial ligaments have been torn, and rigidity of the muscles in the region of the joint. The therapeutic test is the most confirmatory fact we have, viz., proper strapping. This relieves the pain if the parts are in proper relation.

The conditions which must be differentiated are tuberculosis of the sacrum or ilium, pyogenic infection of the bones or joint, chronic sprain of the back, sciatica, congenital malformation of the fifth lumbar vertebra, sarcoma, and appendicitis.

In tuberculosis of the sacroiliac joint the onset is gradual and insidious, and muscle rigidity affecting the spinal, the buttock, and iliac groups is present early; muscle atrophy is also seen early, and the swelling over the joint develops gradually, though not so soon as in the traumatic cases. In the tubercular infection it also gradually increases, while in the condition of separation it tends to lessen, especially if reposition has been accomplished. Sneezing, coughing, or any similar effort causes severe pain in the joint, and total disability rapidly ensues. Abscess formation is very frequent, and operation is commonly resorted to by the surgeon.

Septic infections are of acute onset and may or may not follow an injury. In addition to the fever and other constitutional symptoms with profound prostration, there are the acute and marked local disturbances characteristic of such an infection, and a few days serve to reveal the true nature of the disorder. In this class of cases operation cannot be performed too early. Such procedure will prevent the extensive destruction of the parts which must necessarily follow and the long period of infection, discharge, and drainage which accompanies such involvement.

Chronic sprain of the back is an entity which at times proves extremely baffling. If the involved muscles, tendons, or ligaments are in the neighborhood of the sacroiliac joint, differentiation from relaxation or separation of that part is most difficult. The history of the onset and the progress of the condition may assist, but the relief by strapping is the most significant. In case of a strain the straps are applied vertically to restrain flexion of the trunk and stretching of the involved parts, while in joint conditions lateral compression is desired and they are applied horizontally.

Sarcoma of the sacroiliac joint is occasionally seen, and when it does occur is very difficult of differentiation in the earlier stages of its progress. The constant pain, both local and transmitted, with absence of fever and blood changes and with rather early trophic changes in the lower extremities, should make one suspicious of a possible neoplasm. The *x*-ray in certain cases will supply valuable aid in the differentiation, but in many instances time alone will clear up the condition.

Sciatica or sciatic neuritis may coexist with sacroiliac separation, so that the latter condition must really be excluded as a causative factor before the former can be diagnosed as a separate entity. Rest and fixation after replacement are the greatest factors in the cure of the separation, and if the neuritis is of such origin it will gradually subside under this treatment, while if of independent origin it will be influenced by it but will not yield to it. I have recently had a case in which both were present, and after the sacroiliac trouble had disappeared a slight neuritis persisted for quite some time, though it ultimately yielded to massage and electricity. The pain of sciatica itself has, in my experience, been best controlled by full doses of phenacetine, though it is now almost impossible to secure this drug.

Congenital malformation of the fifth lumbar vertebra, and especially of the transverse process, is now found by roentgenologists to be a very common condition. Many of these abnormalities give no clinical evidence of their presence and are found only when a plate is made for study of some other structures in this region. In other instances, however, the nature of the work done by the patient causes an unusual strain upon the part or that related to it, and by direct or indirect injury produces disability. One of my cases was a fireman on an engine, and the bending and lateral twisting in shoveling and stoking caused a hypertrophied lateral process of the fifth lumbar vertebra to strike the border of the ilium and set up an inflammation which completely disabled him. Removal of the end of the process gave him complete relief. Posture in these cases excites the pain, and there is but a slight amount of muscle spasm excepting during the attack of the inflammation. The *x*-ray will also show the true nature of the trouble, though it may be suspected from the symptoms.

While one does not ordinarily think of the appendix as in any way related to the sacroiliac joint, yet I have had two cases in which appendicitis was diagnosed as trouble in the sacroiliac joint, and a widely known and most competent surgeon curetted this joint in one case, but of course without relief. Examination routinely of the abdomen as well as of the back and careful scrutiny of the history will recognize the presence of appendix trouble and will sometimes save both patient and physician needless annoyance and worry.

As before mentioned, the most important point in the diagnosis and the differential diagnosis of sacroiliac relaxation or separation is the therapeutic test of strapping after manipulation and reduction of the part. This strapping should be done most carefully and with a certain definite purpose in mind. The parts are in normal relation and they must be held so. If the straps are too short, too loosely applied, or applied at wrong levels or in improper directions, the parts will not be fixed and the pain will not be relieved. When properly used, the therapeutic test proves one of the most reliable diagnostic signs in these conditions.

The prognosis is good. Almost all cases yield to proper treatment. Occasionally one may come to operation for fixation, but this is very rare. The treatment, as mentioned before, consists in replacement, fixation, rest, and operation.

Replacement frequently occurs of itself, and in such cases there remains only the soreness, which persists for a week or two. When the symptoms, however, continue acute, the patient should first be placed upon his back, the sound leg held firmly to the surface on which he is lying, and the leg of the affected side should be forcibly flexed on the abdomen. It may also be moved in strong abduction, and if relief does not obtain the other leg should be similarly moved. If this is insufficient he should be turned on his face and hyperextension of the leg used, the pelvis being fixed by pressure over the sacrum. It is not always possible to determine whether the displacement is backward or forward, but these movements will suffice to restore the parts in most cases. Some operators claim that a distinct click or snap is heard at times, but I have neither heard nor felt it in my cases. (*Note:* Two days following the reading of this paper I attempted reduction of one of these cases of eight weeks' standing, and manipulation caused a click which was heard by the assistant as well as myself, and as recovery has resulted it is probable that the parts slipped together at that time.) The patient experiences relief as soon as reposition has been accomplished and should be kept in the same posture until adhesive straps are applied. These should be about two inches wide and long enough to reach from in front of the anterior superior spines of one side across the back to the same position on the other side. Three or four of these are applied firmly between the iliac crests and the great trochanters, then two strips are applied obliquely from the edge of the ribs to the opposite buttocks. This usually maintains

the parts in good position, though it may be reënforced by a bandage or belt if desired. If the skin is easily irritated by the adhesive plaster, it should be first bathed with a solution of borax before applying the adhesive. This will frequently prevent trouble with the skin. In some cases an anesthetic is necessary for the manipulations, but these are usually of the chronic variety. The acute ones are generally easily replaced. When a belt or bandage is applied, it must be placed below the iliac crests in order to prove efficient. If it includes these parts, the effect is frequently to force the upper parts closer together and to separate the lower portions and allow slipping of the joint. After a support has been applied which maintains the parts in position, the patient must be kept at rest for about a week until the inflammation following the traumatism subsides and the ligaments contract to hold the parts firmly. Under the influence of these two factors (fixation and rest) most cases recover promptly. Certain ones, however, may require a more elaborate form of support, in the shape of a corset of celluloid or plaster of Paris or a steel brace. These should be applied and fitted most carefully, with the mechanical needs of the case kept uppermost in the mind.

Again, certain cases cannot be supported by any form of brace or belt that may be applied and must be operated upon to secure fixation. Several methods of operation are available. In one the joint is exposed and partially destroyed by a gouge or chisel, and then held firmly fixed until solid union occurs. This obtains fairly readily, as the stimulation of such cartilage by traumatism favors rapid bone proliferation and transformation.

Again, a bone-graft may be placed across the joint, a bed having been digged through the ilium into the side of the sacrum. This proves most satisfactory, though care must be had that the spinal canal in the sacrum is not opened or penetrated by the graft, as pressure upon the nerve trunks or roots will cause paralysis. In doing this operation, it is well to take the bone-graft from the tibia of the sound side. In one of my cases, a highly nervous patient, sensory paralysis of the leg from which the graft was taken developed on the second day after operation. Had the other leg been robbed, it would have occasioned considerable anxiety and apprehension as to the possible damage of the nerves by the graft.

In all these cases accurate diagnosis is the first essential, and this is aided by familiarity with the symptoms. Careful reposition of the misplacement is the second essential, and the third is effectual maintenance of the parts in their normal relations until firm union or contraction obtains.

TONSILLITIS: ITS SEQUELAE AND ITS TREATMENT.[1]

BY NATHAN P. STAUFFER, M.D.,
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Tonsillitis is one of the most common diseases presented to the general practitioner. Its evil results are becoming more apparent each year, especially when one delves deeply into the various history charts. Possibly the general practitioner thinks it strange to hear the rhinologist harping on tonsillitis, but he must remember that tonsils and their sequelæ form about 70 per cent of the nose and throat diseases. It has only been a few years since the reports of Rosenau and others have shown us what a train of diseases tonsillitis can start. As evidence of the great variety of diseases which tonsils can be guilty of I will speak of those cases I saw in one day:

1. Miss McK., a child of nine years, with acute endocarditis following tonsillitis.

2. Mrs. B. F. W., a woman of thirty-five years, who has arthritis deformans due to chronic follicular tonsillitis.

3. Mrs. E., a woman of forty-five years,

[1]Read by invitation to the Philadelphia Clinical Association, May, 1916.

with acute articular rheumatism due to chronic follicular tonsillitis.

4. Miss F., a young woman of twenty-one years, with acute purulent otitis media following tonsillitis.

5. Miss C., aged six years, with mastoiditis following tonsillitis.

6. Mrs. K., a woman of fifty years, who has septic rheumatism of the neck and various joints following quinsy. This latter patient came to me after spending weeks with an osteopath who has been promising a cure by rubbing her spine and also making local applications to her throat.

But by far the most frequent sequela of tonsillitis I believe to be rheumatism. Every year I find in the wards of the Presbyterian Hospital many cases of acute and chronic rheumatism which were preceded by attacks of tonsillitis. In the *American Journal of Medical Sciences* for February, 1916, W. S. Middleton of Madison, Wisconsin, and A. J. Smith of Philadelphia report that in 90 per cent of 362 goitrous individuals there were tonsillar and nasal diseases. Think of that, 90 per cent of those having goitres had nose and throat lesions! As so many of these diseases were preceded by or accompanied tonsillitis, would it not seem the proper procedure to remove the tonsils when suspicion pointed their way? How can one expect to cure a disease when the principal focus may still be present? Furthermore, when have you seen any one injured by a well-done tonsillectomy?

I will present to-night three patients who have a wide variety of diseases, all caused by their tonsils.

1. Mrs. L., a keratitis following a single attack of tonsillitis, and who will only be cured by suitable attention to her tonsils as well as her eyes.

2. Master W., aged five years, now in the curative stage of cervical adenitis. These glands should subside if the adenoids and tonsils are properly enucleated.

3. John K., a bedridden, crippled rheumatic patient, who spent a year of pain on a bed in the Presbyterian Hospital, who never had tonsillitis attacks, yet had a complete cure of his rheumatism by the removal of his small but diseased tonsils. He has a new lease on life and is now a most ardent advocate of tonsillectomy for rheumatism.

In the treatment of tonsillitis I divide the subject into four parts: (1) Incipient tonsillitis; (2) Active tonsillitis; (3) Preventive tonsillitis; (4) Complications of tonsillitis.

1. When a patient reports to you complaining of malaise, a fulness in the ears, and a sense of tension under the angle of the jaws, with a slight temperature, some headache, or backache, accompanied by a slight soreness of the throat, you may feel sure you have the incipient stage of tonsillitis. If the patient will immediately go to bed, where he will have absolute rest, keep ice constantly in the mouth, and cover the throat with an ice-bag, he will be properly started on the road to an early recovery. Calomel, 1/10-grain doses, dissolved in the mouth every hour for the first two days. with salts at night, with aspirin five grains or sodium salicylate five grains every three hours, I have found the most reliable remedies. Local treatment aids much in aborting the disease. For this daily applications of nitrate of silver 60 grains to the ounce with 50-per-cent Dobell's solution every hour as a gargle are the best antiseptics.

2. *Active tonsillitis.* In this stage I insist on the patient remaining in bed, because of the possibility of an endocarditis complicating his tonsillitis. A dry ice collar is applied, with frequent sponges with alcohol and oil of wintergreen rubs. Gargle every half-hour with 50 per cent H_2O_2. Locally I paint the tonsils liberally with 60 grains to the ounce of nitrate of silver. I have seen symptoms decline and convalescence quickly started by this ideal remedy in the early stages of the disease. Guaiacol 25 to 50 per cent in olive oil is the next best remedy. This should be rubbed in the tonsil twice daily for several days. It produces a hot, peppery sensation for about a minute, followed by immediate relief. Sodium salicylate grains 10 every three hours with water, or lemonade, will relieve the headache and backache. If the tonsillitis is ac-

companied by peritonsillar abscess, with its excruciating pain and profuse flow of saliva, I have found the only relief is the early use of the knife. The pus is usually in one of three places: high up in the supratonsillar space, or between the anterior pillar and tonsil on a level with the molar teeth, or between the posterior pillar and the tonsil. If the knife has made a good long and deep incision and you fail to get pus, take an Allis blunt dissector and run it around the tonsil, and you are almost certain to find the pus. Do not be afraid of hemorrhage, as the swollen tonsil and pillars will soon close off any bleeding points by pressure. I believe too many of us fail to give relief because we are too much afraid of hemorrhage. I have seen all sorts of remedies recommended for quinsy, but the knife is the proper one.

The proper practical treatment of tonsillitis should be "prevention.." It can be prevented by removing the cause. You may ask, when do you consider these offending organs should be removed? I will give you five principal indications for the adenoid and tonsil operation:

1. Obstruction to natural breathing symptoms, such as: (1) Restless sleep; grinding teeth; snores or night cries. (2) Mouth-breather day or night; dull facial expression. (3) Malformations of teeth causing inability to keep mouth closed.

2. Frequent attacks of colds, accompanied by: (1) Nose stopped up, producing nasal twang. (2) Easily tired, sleepy during the day, anemic. (3) Purulent rhinitis and pains in the chest, with frequent bronchial attacks.

3. Recurring inflammations of the Eustachian tube and middle ear, as shown by: (1) Attacks of myringitis; acute or fleeting pains in ear. (2) Slight deafness; or (3) purulent discharge and increasing deafness.

4. Recurring inflammations of the throat: (1) Peritonsillar abscess (quinsy). (2) Follicular tonsillitis (chronic tonsillitis). (3) Granular pharyngitis.

5. Complications imperatively demanding operative measures upon tonsils: (1) Enlargement of the cervical glands. (2) Rheumatism, endocarditis, nephritis, enlarged thyroid. (3) Keratitis.

BROMOFORM IN WHOOPING-COUGH.

BY NEAL KITCHENS, M.D., BULLOCHVILLE, GEORGIA.

The use of bromoform in whooping-cough has been followed by such a variety of results in the hands of different members of the medical profession that a great many physicians have cast it aside and now refuse to use it; but whooping-cough, like the poor, will be with us always, and any remedy that promises aught should not be discarded.

Over twenty years ago, when it was first introduced to the profession, I was in turn pleased and disappointed in its effect; but I did not abandon it. After experimenting with it over a year, I found out that the cause of my disappointment was due to the mode of its administration. It should never be compounded with anything. Follow the directions here given, and if one commences its use early I am sure that good results will be obtained. I have seen wonderful improvement even when it was commenced in the advanced stages of the disease.

As to the mode of administration, I advise the giving of one drop for each year of age up to five. Five drops is the maximum dose for five years old and upwards. Give this dose three times during the day and once during the night. Fill a teaspoon two-thirds full of simple syrup, drop in the dose, stir it into the syrup with a small glass rod or a toothpick, and give at once. Every dose should be mixed immediately before giving. As it is inflammable it should never be exposed to the open flame.

THE PHENOMENON OF ANAPHYLAXIS: ITS CLINICAL SIGNIFICANCE AND PRACTICAL UTILIZATION.

BY N. S. FERRY, M.D.,
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Consequent to a few distressing and unfortunate reports which have found their way into the lay as well as the medical press, and as a direct result of some erroneous interpretations of the early fatal experimentations on laboratory animals, an unfavorable impression of the meaning of the term anaphylaxis has been entertained by the public and is still fostered by a large majority of physicians. Therefore, it should be taught generally that anaphylaxis is not a subject of mere experimental research and theoretical considerations, to be thought of only with apprehension and misgivings, but one of the most practical value and clinical importance.

The prevalent or popular conception of proteid sensitization is based on the classic picture of experimental anaphylaxis bequeathed us by the guinea-pig; a phenomenon rarely seen in the human subject and seldom observed in any animal other than the guinea-pig. It is a picture that belongs to the research laboratory and not to the bedside. A few cases of sudden death, following the therapeutic use of horse serum, have been reported, and the relation of some of these to anaphylaxis cannot be gainsaid, although it is extremely doubtful if more than a small percentage were a direct result of a sensitization to the proteid in question. Other abnormal conditions or pathological lesions have been found at autopsy to explain a large number of the fatalities; especially the condition of lymphatism, better known as *status lymphaticus*.

The fear of fatal results from the use of therapeutic sera that pervades the ranks of the laity should, by means of intelligent and constant education, be allayed, as ignorance on this subject no doubt contributes to the death of many individuals who otherwise might be saved. There is practically nothing to be feared from the serum itself, or the mode of its introduction into the system, provided proper precautions are observed by the physician. There is no question but that more die from antitoxin starvation in one month than will ever die of antitoxin anaphylaxis. According to statistics by Park, which have frequently been quoted, the mortality from diphtheria in New York dropped from 36.4 per cent in 1893 to 10 per cent in 1905, a fall of 26.4 per cent. Also, there were only two sudden deaths out of over 50,000 cases following the injections of antitoxin. This means that if we allowed ourselves to be frightened by two fatal cases, over 26 per cent of all cases of diphtheria would die for the want of proper treatment. There are many other therapeutic agents that directly produce a much higher percentage of fatalities without their usefulness being seriously handicapped.

Experimental and clinical anaphylaxis are two entirely distinct conditions, due to the fact that proteid sensitization does not express itself in the same way in all animals. The manifestations in the guinea-pig are the most violent of the experimental animals, while the symptoms as recognized in man are relatively mild. According to Hektoen, the guinea-pig "gives the most constant and most intense symptoms, being four hundred times as sensitive as the rabbit." In dogs there is a rapid fall in blood-pressure, but not the respiratory symptoms as seen in the guinea-pig. In cattle there is an enormous edema of the udders and a cyanosis of the mucous membranes. It is said that the white mouse is practically refractory to proteid sensitization. Therefore, when a condition is known to differ so widely in various animals it is folly to attempt to compare one with the other and to judge the results of the injection of a proteid into one by the symptoms in another. When considering anaphylaxis, the human subject should not be made comparable to any other animal organism.

Nor must it be forgotten that the term anaphylaxis, as given to us by Richet, is a misnomer. Proteid sensitization or "allergy," as it is called by von Pirquet, is no longer regarded opposed to or against protection. All experiments seem to point to the fact that it is, after all, a form of prophylaxis and not anaphylaxis. The term anaphylaxis should no longer be used to designate the condition known as proteid sensitization. According to Bordet, proteid sensitization or, as it is unfortunately incorrectly termed, anaphylaxis "testifies to the fact that the struggle against a foreign element is taking place." Vaughan says: "Sensitization and immunity are different manifestations of the same process." Emery sums up the subject as follows: "It seems to me that we may regard anaphylaxis as a necessary step to the development of immunity to toxins—disadvantageous in itself, but of advantage in that it represents a stage in the production of a more resistant condition." And Grinnan goes so far as to state that "prophylaxis depends upon anaphylaxis." It may or may not be a fact that prophylaxis depends upon anaphylaxis, that sensitization and immunity are different manifestations of the same process, but it is certainly true that it is the result of the attempt of the body to protect itself, and instead of being antagonistic to prophylaxis, is an expression of resistance, an indication of defense, and, therefore, a form of immunity.

Much has been written, from a theoretical standpoint, and a large amount of work is being done at the present time, relative to anaphylaxis, and while very little advance has been made as to the exact relationship of the proteid molecule to the phenomena, the fact is paramount that certain individuals are in some way hypersensitive to certain proteids. Personal idiosyncrasy and individual susceptibility are terms that have been used for years to denote certain conditions in individuals due to a hypersensitiveness to certain substances, either proteid or non-proteid. While the underlying causes of the various conditions included under these terms may be found ultimately to be identical, this idea cannot be reconciled with recent experimental data and clinical evidence, and, therefore, at present, proteid sensitization is considered to be a condition peculiar to itself.

In order to attempt to control the phenomena of anaphylaxis (including all proteid idiosyncrasies) for clinical and therapeutic purposes, experimenters have studied the problem from a practical standpoint, and many facts have already been learned relative to the prophylaxis and possible alleviation of some of the obscure conditions relative to proteid sensitization, and methods have been perfected for employing these same unknown phenomena for diagnostic purposes by adapting the many experimental and clinical findings to a practical end.

It has been known for a long time that when certain proteid substances are injected into certain individuals more or less of a reaction will be produced in that individual. It is said that that individual is hypersensitive to or has an idiosyncrasy for that proteid. That individual is, for some reason or other, unusually or abnormally sensitive to that proteid, and this shows or manifests itself by means of a reaction, either local or general, depending upon the quantity of proteid as well as the method and site of injection. If the proteid is deposited upon mucous surface of the conjunctiva, administered cutaneously or intracutaneously, or massaged into the skin, the anaphylaxis will manifest itself as a local reaction at the site of application. If an injection is made subcutaneously the reaction may be local or general, depending upon the amount of proteid; and if given intravascularly, intradurally or intraperitoneally, the reaction will be general. Being specific, some of these reactions are employed daily, for diagnostic purposes, in a large number of known as well as obscure conditions.

It is an interesting fact that the first known observation of an anaphylactic or allergic phenomenon was that of a skin

reaction made by Jenner in 1798. It was noted, during his experimental work with smallpox vaccine, that the animal organism, once having passed through an attack of either cowpox or smallpox, may respond to the cutaneous application of the virus, if made years afterward, by an "early local cuticular inflammation." This reaction was used many years later by von Pirquet as a basis for the construction of his theory of clinical allergy, and is now an every-day observation.

Possibly, also, one of the most important observations, from a clinical standpoint, was that of Koch, in the early part of his work, to the effect that an injection of tubercle bacilli under the skin of a tuberculous guinea-pig, instead of causing a progressive infection, would result in a necrosis and sloughing at the point of inoculation. This finally led to modifications which are now universally recognized as the tuberculin reactions.

From this time on stray observations relative to proteid sensitization were made, but it was not until the investigations of Richet (1902), Arthus (1903), and Theobald Smith (1904) were published that research along this line received its proper stimulus, resulting in the work of Otto, Rosenau and Anderson, Gay and Southard, Vaughan and Wheeler, and Nicolle. These investigators, all pioneers in the subject, were followed by a host of others, engaged in the many phases of the question, who have added a few new facts; up to the present time, however, the many data, gained clinically and experimentally, have not been pieced together into a theory offering anything like a satisfactory explanation for all the known phenomena of proteid sensitization or anaphylaxis. A number of theories have, nevertheless, been advanced which may aid in the future elucidation of the problem, all of which are founded or based upon a single hypothesis, namely, in order for an individual to be subject to an anaphylactic condition, there must have been a previous parenteral injection of the homologous alien proteid.

The specific or diagnostic reactions, assumed as of a probable anaphylactic nature, which are related to diseases of microorganismal origin, are all explained essentially according to the same principle, namely, that the primary infection sensitizes the individual—acting as the first or sensitizing injection—while the symptoms of anaphylaxis, following the application of the homologous proteid, whether ophthalmic, subcutaneous, intracutaneous, or cutaneous, are indicative of the reaction.

So long as the microörganismal proteids are present, it matters very little as to the exact method of preparation of the diagnostic material, as has been established by the fact that while various methods are being used, all are giving practically the same results.

Of the various tests of practical value that depend upon the anaphylactic reactions for their usefulness, the tuberculin tests are perhaps the most widely applied at the present time. The tuberculins employed for diagnostic purposes are essentially concentrated bouillon filtrates of a culture of the tubercle bacillus, or the desiccated proteids from the filtrate produced by precipitation and purification.

Another reaction, somewhat analogous to or resembling the tuberculin reaction, which is devoted to diagnosis of glanders in animals is the mallein reaction. The animal suffering with the disease is sensitized to the proteids of the specific microörganism, while the reaction, a local anaphylactic manifestation, is produced by the application of the mallein. Mallein, a bouillon filtrate prepared in a similar manner to the tuberculin, contains the proteids of the Bact. mallei.

The luetin test, proposed by Noguchi for the diagnosis of syphilis, is another reaction of like nature and of great diagnostic value. The proteid material in this case is represented by the entire culture media containing the devitalized spirochæta.

Other tests, depending upon microörganismal proteids, of less diagnostic importance at present, are the typhoid ophthalmic test of Chantemesse, Austrian, and

others, and the typhoid cutaneous test of Link and others—the proteid material being either the whole organism in bouillon, extracts of the organisms, or preparations made from the organisms. Other tests the value of which are not as yet fully established are the test of Iron for gonococcus infections, the diphtherin test as described by Kolmer, and possibly others.

The reaction after the use of bacterial vaccines for therapeutic purposes, termed the "negative phase," may likewise be of an anaphylactic nature; the infection sensitizing the individual while the injection of the suspension of dead bacteria produces the reaction—a general reaction in this case. It is a recognized fact that the larger the dose of vaccine the more severe will be the reaction. This reaction offers, in some instances, a means of diagnosis or of determining the specificity of the vaccine in question, and may be employed as well as an indication of the size of dose to be subsequently administered.

Other diagnostic reactions of an anaphylactic nature are related to vegetable and animal proteids. The question of a means of diagnosis for these various idiosyncrasies is one of the most interesting phases of the entire subject, and opens a field of exploration hitherto restricted to a few of the food proteids and the proteids of some of the common plant pollen.

The first of these susceptibilities to attract the attention of investigators was the condition known as hay-fever. This symptom-complex was found to be associated with the pollen of various plants, and later attributed to the proteids of the pollen as a result of investigations relative to the ocular and cutaneous tests. Sensitization may now be determined by means of any one of the tests previously cited, and resistance against this sensitization may be obtained by means of prophylactic subcutaneous injections of extracts of the pollen. Whether it results in the production of immunity, according to the universal interpretation of that term, or in an increase in the tolerance against the proteid, similar to an increased tolerance to any drug, such as arsenic, morphine, and others, is a question yet to be solved.

The fact remains, however, that a large per cent of individuals are either entirely or partially relieved of symptoms by means of prophylactic injections of extracts of pollen, although the treatment must be repeated seasonally. Individuals should be tested previous to treatment by either the cutaneous, intracutaneous, or ocular methods to determine to which proteid they are sensitive, for otherwise they might be made hypersensitive to a proteid to which, normally, they are not sensitive.

Contrary to some authorities the author has found that aqueous extracts of the pollen do not deteriorate as rapidly as has been stated. If properly preserved they will retain their initial activity for at least a year.

The last two or three years a large amount of work has been done in an attempt to associate several obscure conditions, especially various skin lesions, with anaphylaxis. The most encouraging results have been obtained with eczema and the erythematous and urticarial rashes.

Strickler and Goldberg, White, Blackfan and others have found that sensitizations to certain foods are responsible for a large number of cases of eczema. This, of course, is an important finding, as it clears up a question that has long been puzzling the medical profession. In order to determine the article of food to which these patients are susceptible either the cutaneous or intracutaneous tests are resorted to.

According to White, only about 20 per cent of eczematous individuals do not appear sensitized to any of the common food types.

Blackfan found "of twenty-seven patients with eczema, twenty-two gave evidences of susceptibility to proteins," and that "the removal of some or all of the animal proteins from the food brings about great improvement in some cases of eczema in older children and adults."

McBride and Schorer found that "certain of the proteid foods, on ingestion by certain

individuals, produce urticaria and erythemata and other symptoms," and that "each food produces fairly constant skin lesions . . . fish, tomatoes and cheese only producing urticaria, while cereals and pork produce erythema in a considerable proportion of the cases." "Treatment should be specific. After getting rid of parasites and disease, if there still is hypersensibility, then immunization by feeding is usually but not always possible."

Other skin lesions have been mentioned as probably due to food or other idiosyncrasies, but not enough work has been done on them to warrant any discussion at present.

A very important field has been opened up as regards the anaphylactic nature of many obscure asthmatic conditions or even certain conditions simulating the hay-fevers. It has been found that many of these cases are sensitized to one or more proteids, and recoveries have been reported as a result of a total abstinence from that proteid following a specific skin test.

Certain forms of emphysema and edema of the lungs are conditions of an obscure nature that may be proved to be of anaphylactic origin in the near future, although nothing definite, as yet, can be said to sustain this opinion.

As food for thought it might be mentioned that the view has been advanced that puerperal eclampsia, the crisis of pneumonia, and the acute exanthemata are in some way associated with the phenomenon of anaphylaxis. Most of the statements as regards these conditions are made merely as suggestions and are not fortified by any experimental data. It will be noted, however, that the period of incubation which characterizes all experimental phenomena of anaphylaxis is, in pneumonia, represented in the period from the time of infection into the crisis; also that the acute exanthemata have incubation periods and lesions of the skin that singularly typify those of proteid sensitization.

The question naturally arises as to the methods pursued for the protection against and relief of the various anaphylactic conditions found in the human subject. For the prevention of symptoms resulting from the injection of horse serum there is no doubt, if care is taken to test the sensitization of each individual to horse serum, by means of either the cutaneous or intracutaneous reaction, that a large number of patients might be saved the necessity of undergoing many of the disagreeable symptoms, and perhaps the number of fatal cases would be materially decreased. If the reaction is positive the patient is considered sensitive to horse serum, and extreme caution must be practiced in the administration of the serum.

Several methods have been suggested for the injection of serum in a patient known or suspected to be sensitive to horse serum, some of which are more practical than others. Besredka has advised the initial subcutaneous injection of a very small dose, about 0.1 Cc. to 0.2 Cc., followed within two or three hours by the full dose, providing no untoward symptoms have appeared. The anaphylactic shock is said to be prevented or suppressed by rectal injections of the serum or by means of subcutaneous injections given a few hours apart, starting with small doses and gradually increasing them. It has also been advised to dilute the serum with about 500 Cc. sterile physiologic salt solution, giving the mixture very slowly by means of hypodermoclysis. It is considered much safer to have the proteid absorbed slowly, not allowing the entire amount to enter the body parenterally at once.

Several methods have been proposed for the prevention and cure of the various food idiosyncrasies, some of which have proved more satisfactory than others. The method of withdrawing from the diet the proteid in question or all proteids is practiced by some; this, however, has one great disadvantage in that it is not permanent. Another method advocated has for its object the gradual raising of the tolerance of the individual by feeding the proteid in question or by rectal injections, starting with doses

smaller than would produce the reaction and gradually increasing the dose until the patient can partake of the desired amount of food without exhibiting any of the usual unpleasant symptoms. A good method of carrying out this procedure is by feeding the food in gelatin capsules.

Based on the results obtained from the injection of the pollen extracts, the most plausible and practical method, as carried out by some, is to prepare an aqueous extract of the food which would contain the proteid, and injecting this subcutaneously, starting with small doses, or by precipitating and desiccating the proteid and injecting the required amount of this in solution.

Unfortunately, however, none of these methods have proven entirely satisfactory, as quite a percentage of patients appear absolutely refractory, no matter what form of treatment is instituted.

Another use for the anaphylactic phenomena has been developed somewhat analogous to the precipitin test for the identification of blood, seminal, and other stains. Minot and Leclerc have shown that guinea-pigs, which have been sensitized by injections of human semen, suffer from symptoms of anaphylaxis on subsequent test injections. This has been proven specific, as other similarly sensitized guinea-pigs do not react to the injection of a testicular extract of other animals, or to the injection of human serum. Dale, also, has recommended the anaphylactic reaction for the identification of protein substances, such as blood-stains, *in vitro,* by the use of the graphic method with excised uterine muscles. It was found that guinea-pigs sensitized with human serum react much better with human serum than that of the higher apes, and not at all with the serum of other species, such as the dog, ox, or fowl.

Discussion.—Considering the various instances cited for the application of the anaphylactic phenomenon, it appears evident that it is one of the most valuable diagnostic agents we have at present, and while it is not the dangerous reaction it was once thought, its absolute control must be acquired and more must be known about it before it can be employed for every-day clinical purposes, to advantage, in all instances.

THE REGULATION OF THE BLOOD VOLUME AFTER INJECTIONS OF SALINE SOLUTIONS.

In the *American Journal of Physiology* of August 1, 1916, BOGERT, UNDERHILL and MENDEL point out that the regulation of the blood volume in normal animals is both rapid and efficient; for complete restoration of the original blood volume takes place within thirty minutes after the intravenous injection of a quantity of saline solution equal to the calculated blood volume of the animal.

The activity of the kidneys is not essential to this regulation of the blood volume, as it occurs even after ligation of these organs.

In conditions of nephritis, inability to restore the blood volume to normal after injections of saline solution usually manifests itself. Experiments on animals with uranium nephritis confirm the results of Boycott in this respect. New experiments on animals with nephritis induced by sodium tartrate reveal a similar incomplete regulation of the blood volume under these circumstances.

Morphine sulphate, administered subcutaneously in large doses, produces an effect on the regulation of the blood volume comparable with that resulting from a condition of nephritis.

The factor of species is probably of little importance in studies on this regulation of the blood volume, since dogs and rabbits react alike when the conditions are identical.

Restoration of the blood volume to normal after intravenous injections of saline solution is not primarily effected by the transfer of the excess of fluid from the blood-vessels to the thoracic lymphatic system. The tissues act as a reservoir for this fluid.

The capacity of the tissues of rabbits to absorb fluid is approximately four times the normal blood volume of the animal.

EDITORIAL.

RESUSCITATION IN VARIOUS FORMS OF ASPHYXIA.

It not rarely falls to the lot of a medical man to be called upon to carry out artificial respiration, because of a complication arising from a surgical operation, in cases of drowning, or when illuminating or coal gas has been inhaled. Many years ago the writer of this article and Dr. Martin carried out a research upon the quantity of air which could be propelled into and out of the lungs by Marshall-Hall and Sylvester methods, and found that the latter was more efficient than the Marshall-Hall procedure. Since then Schäfer has brought forward his method of artificial respiration, in which, it will be recalled, the patient lies with the anterior surface of the body downward and the head turned to one side. The operator then kneels astride of the patient's loins and by pressure upon the floating ribs, just above the kidneys, cause ingress and egress of air from the chest. Schäfer seems to have proved that this method moves a greater volume of air than the two older ones, and he and others who have investigated it in England have heartily recommended it for the resuscitation of the apparently drowned. In our own limited experience with it, it has seemed disadvantageous in that it is more prone than the other methods to dislodge the contents of the stomach, pumping them into the esophagus and pharynx, and so causes their introduction into the air-passages. On he other hand, it can well be urged that the posture of the patient and the movements of the physician can more readily displace fluid from the bronchial tubes when this method is followed than when the patient lies upon the back as in the Marshall-Hall or Sylvester methods.

Many years ago Fell introduced a mechanical apparatus for the development of artificial respiration which, in some respects, resembled those forms of apparatus which are used in the physiological laboratories for the maintenance of artificial respiration in animals, and since that time a number of more or less complicated mechanical devices, to which such names as pulmotor and lungmotor has been applied, have been invented. In the use of all of these an endeavor is made to provide the patient not only with air but with oxygen as well, and most of them have gauges and valves whereby the supply of air and oxygen can be readily adjusted. In cases of apparent drowning such apparatus cannot be as useful as the older forms of artificial respiration, since it does not tend to pump the liquid out of the lung, but, on the contrary, may serve to drive it into the smaller bronchioles, where it will do damage and from which it cannot be displaced. Furthermore, if these mechanical devices are not used by those who are skilful in their employment there is a chance that too high pressure will be employed and that artificial emphysema will ensue.

In this connection an investigation which has been carried out by Henderson is of considerable importance and interest. He points out that superintendents of hospitals, mines, gas works, electric light and telephone companies, fire departments, and persons in charge of swimming places are continually asking for advice as to the relative merits of the different kinds of apparatus which are now on the market, which are variously called pulmotors, lungmotors, etc. As a result of a consideration of all the forms of apparatus which are commonly employed he concludes that approved, prompt manual methods of artificial respiration will accomplish more for resuscitation from drowning, electric shock, or asphyxia than is possible with any form of apparatus. One of the reasons for this probably lies in the fact that the application of the hands to the chest induces what has been called in Europe "cardiac massage," or, in other words, exercises an effect upon the congested right heart and the engorged great veins of the chest. It is also important

that those who are called upon to resuscitate persons suffering from asphyxia shall be thoroughly trained in the use of the manual methods, since the delay in sending for mechanical devices may be fatal. In other words, every minute that passes after respiration has apparently ceased greatly diminishes the chance of resuscitation, and while a proper apparatus correctly used and immediately employed in suitable cases may be better than the manual method, practical experience shows that it is rarely immediately at hand.

In gas and smoke cases Dr. Martin and the writer proved, many years ago, that the addition of oxygen was most efficacious, and if a complete artificial respiration apparatus cannot be had oxygen gas should be freely given to the patient, mixed with atmospheric air, care being taken, however, that it is not driven into the lungs under such pressure as to induce distention and emphysema.

THE MIND AND THE BODY IN SURGICAL OPERATIONS.

One of the greatest advances which has been made in the study of surgical anesthesia has been the recognition, on the part of surgeons and anesthetists, that entirely apart from the danger to life exercised by a general anesthetic there is often a very grave effect produced upon the body by the inhalation of these drugs. Another important advance, which medical men have recognized for a longer period than have the surgeons, is that the administration of an anesthetic and the operative procedure produce certain changes, functional or organic, in the central nervous system which must always be taken into careful consideration. Not infrequently these changes do not materially retard the recovery of the patient from the wound which the surgeon produces, and therefore the surgeon, having dismissed the patient with the wound healed, believes that he is cured, or relieved, and has no further sense of responsibility concerning him, but the family physician finds that for weeks and months afterward the patient suffers from various symptoms and annoyances which may really be of greater moment than those which were due to the disease, or condition, which was subjected to operation.

Even to-day far too little attention is paid to the psychic condition of the patient prior to operation. The necessities of modern antiseptic surgery require that the surgeon and his assistants shall be dressed in garments which are peculiar and, to the uninitiated, strange, and when these individuals not only are decked out in long white rough-dried gowns but have their faces masked with surgical gauze and their heads tied up in one form or another, the patient sees before him a figure identical with that of a member of the Kuklux who used to frighten the Southern negro after the Civil War. The inexperienced resident physician sometimes has hanging to the lapel of his coat, or to some part of his gown, one or two glittering tongue forceps, and he approaches the patient either with a degree of timidity, which fails to inspire confidence, or with an assumed boldness of manner which is equally disturbing to one who feels that the most serious moment of his life has arrived. All too frequently the anesthetist is more concerned with what his chief will think of him if the patient is not hurried into unconsciousness than he is with what the patient will think of him, or of the state of the patient's mind when semi-intoxicated by the anesthetic.

No better illustration of the trustfulness of human nature can be found than that manifested by the man, or woman, who walks into what he or she believes to be, and what really is, "the valley of the shadow of death," led by a youthful physician.

In the *Clinical Journal* of July 26, 1916, Maylard, one of the surgeons of the Victoria Infirmary of Glasgow, discussed this subject from a somewhat different point of view, and goes so far as to express the belief that recovery from the operation itself, and recovery as to the healing of the

wound as well, depends not rarely to a great extent upon the psychic state of the patient, and he cites clinical instances to support his view. In one instance a medical man suffering from duodenal ulcer, with no complications, hearing that the surgeon's mortality was one per cent yielded himself to operation, but said beforehand that he would be the one per cent. The operation was not a complicated one, but the patient from the first was firmly convinced that he would die. He died fourteen days after the operation through failure of proper union. Maylard thinks this was due, in part at least, to the mental state of the patient, which is questionable. Nevertheless, the case serves to emphasize the importance of the mental attitude of the patient as to recovery.

Every physician is familiar with the rapid breakdown that occurs in the general system in a patient, particularly a woman, who is informed that he or she has an inoperable cancer; indeed the speediness of the downward course in these cases, after the patient is informed about the disease, is one of the most remarkable things in medical experience. In this connection it is interesting to get Maylard's view. He thinks that if on operation one finds carcinoma he should not take away those saving attributes called hopefulness and ignorance, and so make the rest of life miserable, when if nature had taken her course and the surgeon had not usurped her prerogative by any operative intervention it would have been, perchance, some months before the patient had grasped the condition of affairs, and thereby these months would have been comparatively happy and life would have been prolonged.

In that remarkable address which Trudeau delivered before the Congress of American Physicians and Surgeons some years ago, he emphasized the importance of optimism in medicine, and he did not mean to exclude surgery. There must be some surgeon with a skilful pen who will be able to do his fellow practitioners, and many patients, much good by an address dealing with the importance of optimism in surgery before operation, during operation, and after operation.

EXPERIMENTS VERSUS CLINICAL EXPERIENCE.

We have repeatedly pointed out in these columns that the value of experiments made upon animals in regard to the action of drugs is very great and cannot be denied. In some instances these experiments add very materially to our knowledge and, if correctly interpreted, aid us in the treatment of those who are ill. In other instances, however, the fact that drugs act differently in some animals from their action in man, and that they act differently in disease from what they do in health, renders it necessary not to accept laboratory conclusions as possessing too much authority. Oftentimes these laboratory researches reveal the fact that a drug acts in producing its results in a manner which is different from that which has been thought to exist. The laboratory investigator is too much inclined to contradict universal clinical experience by reason of a few investigations. Possibly the clinician is too much inclined to give little weight to such experiments.

The readers of the GAZETTE will remember that some years ago a paper was published from a pharmacological laboratory in which the dogmatic statement was made that ipecac did not act as an expectorant. Later other investigators claimed, as a result of their experiments, that chloride of ammonium did not act as an expectorant, and that its use by the profession for this purpose was based upon an erroneous conception of its value. Such dogmatic statements are always dangerous, particularly when they contradict the results of wide experience, and for this reason we have noticed with interest a valuable contribution to the *American Journal of the Medical Sciences* for October, 1916. Warren Coleman, addressing the Association of American Physicians, describes in detail the

methods which he employed in his research in order that their thoroughness may be an evidence of the correctness of his views. He contradicts the results of previous investigations and reaches the conclusion that clinicians are justified in their belief that chloride of ammonium acts as an expectorant, that it is eliminated as such by the bronchial secretions, that it facilitates expectoration, and, finally, that it probably acts by increasing the water in the secretions and so softening the mucus.

THE USE OF PITUITARY EXTRACT IN OBSTETRICS.

So much has appeared in medical literature during the last seven years in regard to the employment of this substance in obstetrics that correct conclusions can now be reached in regard to the limitations of its usefulness. From the very first it has been evident that this substance is capable of exerting a most extraordinary influence over the parturient uterus. It has also become clear, as ordinary reasoning powers might in the first place have revealed, that pituitary ought not to be employed unless the os is thoroughly dilated and unless there exists no obstruction in the pelvis to the birth of the child. It would also seem that it cannot be administered as freely or as carelessly to primiparæ as to multiparæ, which is not surprising in view of the anatomical conditions which are present. From time to time some physicians using this powerful substance have obtained evil effects, but, as we have repeatedly pointed out, it is inconceivable that any substance which is potent to do good when rightly employed can be impotent to do harm when wrongly employed, and if we consider the enormous number of cases in which pituitary has been used, not only in hospitals by men of large experience, but by general practitioners, some of whom have not had large obstetrical experience, it is remarkable that so few evil results have accrued.

In this connection it is interesting to read an article contributed by McNeile in the *American Journal of Obstetrics* for September, 1916, in which he reports a case of ruptured uterus following the use of pituitary extract, and discusses the literature on the subject. That rupture of the uterus may, under certain conditions, take place after the use of so powerful an oxytoxic is not surprising, but it is of importance to note that McNeile from a careful study of the literature has apparently been able to find only sixteen authentic cases of rupture of the uterus following the use of pituitary extract. Seven of these were reported by one observer and five by another, so that all the rest only reported one case, including that of McNeile. We are inclined to think that those who have used quinine in obstetrics with the idea of overcoming uterine inertia might have reported an equal number of cases of untoward effect, particularly as some eminent obstetricians think that quinine by inducing a tendency to hemorrhage should never be employed for this reason.

McNeile's paper is timely in that it serves to emphasize the fact that this drug is so powerful that it should be used with care and should never be abused. He lays down the rule that before it is given there must be complete dilatation and effacement of the os; that the membranes must be ruptured; that the presentation should be longitudinal; that in cephalic presentation there should be no deflection of the head, and the drug should be used only in vertex and breech presentation. Again, that there should be no disproportion between the presenting part and the pelvis; that the presenting part should be completely engaged, and that complete engagement should be considered as being present only after the greatest diameters of the presenting part have passed below the pelvic inlet. McNeile goes so far as to state that this drug has absolutely no place in normal obstetrics, but he recognizes that it is an extremely active oxytoxic and the fact that in properly selected cases it has no equal.

Abused by the lazy obstetrician who

wishes to hurry labor it will do great harm; employed in proper cases it is manifest that it is an excellent drug, which will probably always remain one of our most reliable additions to the materia medica. At present its too free use is doing pituitary extract an injustice.

THE TREATMENT OF FRACTURES.

In so far as current literature is concerned major attention is centered upon the operative treatment of fractures. Nor has much been written bearing upon the management of that vast number of cases which none but the most therapeutically astigmatic surgeon would deem should be treated by other than conservative methods.

A series of papers in the *Boston Medical and Surgical Journal* of September 28, 1916, bearing upon the subject of fracture in general and particularly on methods other than the open one for the proper treatment of these lesions is timely and important.

Darrach first considers the need of early reduction of fracture, with displacement, and holds that more exact replacement can be accomplished in the first few hours than if reduction be delayed, especially if that delay be a matter of days. These early reductions occasion less pain and discomfort, heal more rapidly, and should, wherever this be possible, be preceded by *x*-ray studies. He, however, believes that where an opening is needful to accomplish reduction it is better to wait for a few days, basing this upon the circumstance that the resistance to bacterial infection will then be greater.

Cotton, taking up particularly the question of hip fractures, states, first, as an axiom that the results of the Maxwell method—*i.e.*, double traction—are wretched, the unavoidable mortality is considerable, and the proportion of permanent cripples total or partial is over 50 per cent in any hospital series, and the private cases not much better.

He classifies hip fractures as trochanteric and subcapital. In the latter the question is not only one of position, but as to whether or not any union will occur. This risk of non-union is not only in fractures loose from the time of injury, but also in those apparently impacted. The trochanteric fractures all unite by massive callus and usually promptly, but in the position of coxa vara, with a tendency to adduction contracture. Any treatment which assures a reasonable amount of abduction is adequate for this class. The Maxwell method is efficient, as is the Whitman method, and Moore's scheme of a double spica in flexion and abduction, in which patients can sit up erect, of advantage in feeble patients, and of real comfort. Forced abduction is not needed, simply the prevention of adduction deformity. The subcapital breaks have no massive callus. Some are impacted in the beginning, and if they stay impacted, they unite by bone, slowly. If they start loose, or work loose, they do not unite by bone, and produce cripples. Cotton's idea was to secure to the loose fractures the advantage of impaction; to reimpact those that needed correction; to fix them all in a moderate abduction. The method has been by hammer impaction (after reduction) and a plaster spica. He believes that no one has shown better results in intracapsular cases. This on the basis of 30 cases.

As to flexed spica and wheel-chair in the treatment of fracture of the neck of the femur, Moore notes that in all the methods which depend upon splints and traction for reduction and immobilization a certain amount of movement of the hip occurs in the care of the patient's back, the use of the bed-pan, changing sheets, etc. If the fragments are impacted, and the impaction does not become disengaged, these movements do not interfere with the process of union. Better approximation is obtained and immobilization assured when the limb is placed in a position which relaxes these muscles. Moreover, traction methods disregard this rule, and depend upon reducing deformity by tiring out muscles which produce it.

The method of abduction as advocated

by Whitman is as follows: Deformity, if present, is reduced before the application of the plaster cast. The broken ends of the fragments are held in apposition by placing the limb in abduction and inversion. The short muscles about the hip-joint, which are most active in producing deformity, are relaxed. The adductor group of muscles and the ligaments of the joint, which maintain apposition of the fragments in the abducted position, are put on stretch. The danger of the most common deformities which limit function—coxa vara, eversion, and adductor contraction—is minimized. Immobilization of the fragments is assured by the application of a cast which fixes the leg and pelvis in the position of reduction. Patients treated by the abduction method of necessity are bed patients during treatment, but the dangers of recumbency in old patients are lessened by raising the head of the bed and turning the patient on the side.

Statistics from some of the larger hospitals are of interest as illustrating the high mortality following this injury, and the low percentage of good functional results with the older methods of treatment. Scudder, in 1907, reported the end-results of sixteen cases treated at the Massachusetts General Hospital. But two had functionally useful limbs; thirteen used crutches or cane or had disability in going up-stairs. Only three of the patients, in his series of cases, were over sixty years of age at the time of injury. Walker reported 112 cases, in 1907, treated at Bellevue Hospital, with a death-rate of 16 per cent. Eighty of these patients were traced, and but ten were found to be able to do their usual work, while ten were still in the hospital. In the same paper he reported sixteen cases treated by Whitman's method; seven of these patients were over fifty years of age. There were no deaths. Four had recovered completely and had resumed their usual work; the rest were still under treatment. In 1908, Ashhurst and Newell reported fifty-eight cases treated at the Episcopal Hospital, Philadelphia, with a mortality of 27.6 per cent. Twenty, or 34 per cent, they reported as cured. All of their deaths occurred in old patients, the ages ranging from fifty-nine to eighty-four. Probably there are about 6 to 7 per cent of all treated hip fractures which are of the unimpacted intracapsular variety at the time of injury. The number of cases of disability following hip fracture, resulting from deformity alone, is few compared with those whose disability is due to lack of union. Since it is the unimpacted intracapsular variety of fractures that results in imperfect union, it is to be inferred that a large percentage of the poor results, following the older methods of treatment, is due to impacted fractures becoming loose while undergoing treatment. While absorption of the ends of the fragments, lack of regeneration of bone, and poor blood-supply are factors, the motion at the hip, permitted by traction and splint methods of treatment, is probably the greatest factor in the cause of this catastrophe.

In most of the methods of treatment of hip fractures, which have been advocated in the past, recumbency of the patient is a requisite for their application. In attempting to maintain reduction of the fragments it has been considered essential to have the leg in as nearly as possible the same horizontal plane as the body. To maintain this relationship between the position of the injured leg and body, the Bradford frame and Liston side-splint are used in traction methods, and in Whitman's abduction method the cast is applied well up on the chest.

The most frequent causes of death following this injury in the aged are shock, hypostatic pneumonia, exhaustion, and decubitus. Of these hypostatic pneumonia probably claims more unfortunates than any of the other complications. To guard against this, in the Whitman method, the head of the bed is kept raised and the patient is frequently rolled upon the side. In traction methods, such preventive measures are impossible owing to the extension on the leg and the splints. At the onset of serious complications, treatment of the fracture is immediately discontinued, appa-

ratus removed if necessary, and the patient placed in a sitting posture. In many old, feeble patients this is the only method that will save life. As a result they become wheel-chair invalids with a loose fracture for the remainder of their days.

About four years ago, August, 1912, to Moore while treating one of this type of cases, a man of seventy-eight, for whom recumbency seemed inadvisable, the idea suggested itself that a plaster cast might be applied upon the same general principles embodied in the Whitman method, modified to permit the patient to sit in a wheel-chair. The fracture was the loose extra-capsular type, base of the neck or through the trochanter. No *x*-ray was obtainable. There was 1½ inches shortening. As there seemed to be no contraindication to applying the cast under anesthesia an anesthetic was administered, the patient placed upon a spica board, and the leg drawn down to reduce shortening. Then the thigh was flexed to nearly right angles with the body, abducted as far as possible, and inverted. The knee was flexed at right angles with the thigh, and in this position the leg was lifted upward strongly. An assistant then held the leg in this position while a cast was applied from just above the costal margin to about half-way down on the calf of the leg. The cast was strongly reënforced in the groin, and in the back the reënforcing was carried far inward over the ischium. On the uninjured hip it was brought well down over the trochanter. The patient was then put on a high head-rest in bed. The following morning he was assisted into a wheel-chair, and each day thereafter during the five weeks he remained in the hospital. He was then sent home to be attended by his physician. This patient had a rather troublesome incontinence of urine. which necessitated applying a new cast at the end of three weeks. There was also considerable swelling of the foot and leg below the cast, which was relieved by a firm bandage. Otherwise his convalescence was uneventful. The cast was removed at the end of ten weeks, and at the end of four months he had normal use of the leg.

The result, in this case, was so gratifying that it was decided to apply this method of treatment in other cases. Up to the present, sixteen patients have been treated by the flexion method.

Nine of the sixteen patients were over seventy; the oldest, now in the hospital, is eighty-seven. Three were between sixty and seventy, three between fifty and sixty, and two between forty-five and fifty. Seven patients had good functional results and were able to resume their usual work. In two the result has been poor. One of these was the loose intracapsular type and resulted in non-union. The other was extra-capsular, and resulted in bony union with one inch shortening and no other visible deformity. The disability is apparently due to weakness of muscles. Three patients are still under treatment. Two have not been traced, and one died of grippe twelve weeks after injury, after his cast had been removed and he was walking on crutches. It has been found that patients are much more comfortable when the cast is applied the entire length of the leg, covering the foot, and the method of applying the cast down to the calf of the leg has been abandoned.

In two of these patients a double spica was applied, but both were so uncomfortable that it became necessary to remove the cast from the uninjured leg. If the cast is applied so that it embraces the great trochanter of the uninjured leg, the single spica immobilizes the pelvis as completely as the double spica.

SURGERY OF THE THYROID GLAND.

Though the elaborate and exhaustive researches both experimental and clinical in relation to the thyroid gland and its functions have been prolific of both knowledge of underlying facts and clinical applications of the greatest service, the active constituent of the thyroid gland has not until recently been clearly identified nor its chemical nature and function entirely understood.

The series of papers (*Boston Medical and Surgical Journal*, Oct. 19, 1916) bearing on this subject are of more than usual interest and authority. Kendall began more than a year ago the isolation of a crystalline compound containing 60 per cent of iodine. The first trial was brilliantly successful. Thereafter repeated efforts failed, until finally last year, when success was again attained. Repeated efforts were again unfruitful, until it was discovered that carbon dioxide was absolutely necessary for the success of the research. The substance is so firmly locked into the protein molecule that it withstands most vigorous chemical treatment.

The crystalline compound containing 60 per cent of iodine having been separated from the thyroid, several questions arise as to the relation of this compound and thyroid activity. Thyroid activity can be followed experimentally and clinically in five broad aspects, namely, the effect on growth, on the mentality, the skin, the hemoglobin, and, greatest of all, the effect on metabolism, and incident to this, the effect on the heart. It seems indisputable that all of the effects produced by the thyroid are through its effect on metabolism. The combustion of proteins, fats, and carbohydrates is increased by the administration of thyroid substance, and it is probable that the various clinical changes produced are due to increase in cell activity through the entire body. The mentality is increased because of the increased blood flow, and the increased metabolism going on in the brain cells; the condition of the skin is improved because metabolism within the skin cells is increased; and so it is through the entire body.

Clinical trial has shown that the entire activity of the gland is manifested by the administration of this crystalline compound alone. There seemed to be no other substance in the thyroid secretion which acts directly. When given in very small amounts it will supplant thyroid activity, relieving the conditions of myxedema and cretinism, and in excess will produce symptoms simulating exophthalmic goitre. It appears to have no direct action on the pulse-rate. The extent to which the rate is affected depends not upon the administration of the thyroid, but upon the simultaneous ingestion of food, and in particular of amino acids. This effect may be outlined as follows:

After the administration of the compound there is no apparent effect for many hours. There is no increased pulse-rate, nor drop in blood-pressure. However, if the thyroid hormone and amino acids are injected simultaneously, the pulse-rate is enormously affected, and even death may result, due to the apparently great increase in metabolism going on in the animal. It appears very probable that the thyroid hormone manifests its activity by reacting in some way with amino acids.

Cannon concludes his study of the physiology of the thyroid by stating that the nerves belong to the sympathetic and not to the vagus supply, and that their effects are not indirect through alternations of blood flow but that they are true secretory nerves.

The internal secretion of the adrenal gland, or adrenalin, will have the same effect in the body as sympathetic nerve impulses. Injection of a small dose of adrenin, 0.1 to 0.2 Cc. (1:100,000) evokes a marked action current in the thyroid gland. Also, stimulation of the nerves to the adrenal glands, so as to cause their secretion to be poured into the blood-stream, will evoke a characteristic electrical change in the thyroid. This electrical change does not occur if the return of blood from the abdomen is prevented, but takes place promptly when the pent blood is released. Furthermore, it fails to appear after stimulating these nerves, if the adrenal glands have been previously removed. There is thus definitely established an influence of adrenal secretion on thyroid activity.

This conclusion has been confirmed by the observations of Dr. Robert L. Levy, working in the Harvard Laboratory. He has found that both stimulation of the cervical sympathetic trunk and injection of stimulating doses of adrenin greatly aug-

ment the effects of small doses of adrenin in raising blood-pressure. This increase of efficacy of adrenin is not produced if the thyroid glands have previously been removed.

Studies on conditions of activity of the adrenal glands have shown that during emotional excitement they secrete into the blood a substance which affects the bodily organs in a manner simulating the nervous influences of strong emotions. These glands have a routine function, without which certain bodily processes are not normal. They may also be reasonably regarded as having a normal emergency function, which is exercised in times of emotional stress, and is important under such circumstances for the needs of the organism: for example, in struggle. This conception of an emergency function gives meaning to the liberation of sugar in the blood, abolition of muscular fatigue, dilatation of bronchioles, inhibition of digestion, redistribution of blood in the body, and rapid coagulation —all changes attending great excitement.

If we conceive the organs disturbed in emotional stress as being protected from such disturbance by a high neurotic threshold, requiring great excitation in the central nervous system before the threshold may be crossed, we can account for persistent disturbance of these organs in pathological cases on the basis of a wearing down of the threshold through great or repeated emotional disturbances. Thus there might be gaps here and there in the wall that protects the organs from being overexcited. Under such circumstances, even slight central disturbances might result in persistent stimulation of organs normally brought into action only when such action would be useful—*i.e.*, in times of emotional excitement, when struggle might be essential. If a certain region, *e.g.*, the cervical sympathetic, is thus persistently stimulated by experimental means, most of the phenomena of exophthalmic goitre may be produced. This concept offers an explanation for emotional tachycardia, emotional dyspepsia, and perhaps other conditions which present a history of previous great worry or emotional stress.

To test the effect of overstimulation in a particular region of the sympathetic system, Binger and Cannon fused in the cat the anterior root of the right phrenic nerve with the right cervical sympathetic strand. Thus, after regeneration had occurred, there was delivered to the neurones in the superior cervical ganglion a volley of impulses every time the animal breathed. The operations were performed early in May. In October, four of the six animals were still living. All had peculiar symptoms. There was marked tachycardia. The average heart rate in normal cats is about 150 per minute; in 30 observations on these animals it was 222. Though fed like normal animals, they had loose movements of the bowels. They were unusually excitable, as indicated by rushing away when taken in hand or petted. The basal metabolism, as determined by Dr. Reginald Fitz, working in the Carnegie Nutrition Laboratory, was found in normal cats to be approximately 31 calories per square meter of body surface per hour. In three of the four animals in which the operation had been performed, the metabolism was much elevated. In one of them (in all ways the most profoundly altered animal) it rose to an average of 72 calories per square meter per hour, an increase over 130 per cent above the normal average. In others the rise was approximately 100 per cent. In two animals that died of the disease, the adrenal glands were found much increased in weight. In one of them the glands were three times the average weight, the increase being chiefly in cortical substance. One of the animals had definite exophthalmos and respiratory oscillations of the pupil on the operated side. These symptoms are, in the main, characteristic of exophthalmic goitre as seen in man.

Since these first observations the disease has been produced in another animal, and it has been proved that the symptoms—rapid heart, increased excitability, steadily mounting metabolism, with loss of weight —all disappear on the removal of the thy-

roid gland on the operated side. The metabolism, which had increased approximately 100 per cent, dropped down to within normal limits. Whereas the other animals having the induced disease had died within three months of the first appearance of the symptoms, this animal lived normally for seven months after the operation and was then purposely killed.

The thyroid gland is subject to that division of the nervous system which is brought into action in emotional excitement, and which causes adrenal secretion. It is probable, therefore, that the thyroid, like the adrenal, has normally functions which are performed in times of critical emergency. It may be that such an emergency function is an exaggerated form of the routine activity of the gland.

Boothby (*Boston Medical and Surgical Journal,* Oct. 19, 1916) states that by the term basal metabolism is meant the heat-production obtained under absolute rest and abstinence from any nourishment for at least twelve hours before the determination.

This determination is made by collecting and measuring and analyzing the expired air. DuBois has shown that, when compared by surface area, determined by a height-weight curve proposed by him, the basal metabolism of normal people rarely varies more than ten per cent from an average figure, the latter depending on age and sex. A study of some 600 determinations of the basal metabolism made in the respiration laboratory of the Peter Bent Brigham laboratory has shown that convalescent, postoperative cases of acute appendicitis, hernia, varicose veins, alveolar abscess, and similar conditions, with normal temperature, after varying periods of recumbency, have shown, with one exception, a basal metabolism which did not vary more than 10 per cent from DuBois' normal, and in the majority of cases was within 5 per cent. The patients in whom was observed abnormal variation in the basal metabolism are those in whom involvement of an endocrine organ could either be established or considered as a possibility.

The endocrine organs, by which is meant the ductless glands, furnish a series of substances which are designated by Schaefer as autacoids, which enter into the blood stream and act on certain body cells, either exciting or depressing their functions. For normal metabolism a certain amount of each autacoid is essential, and some proportion between the amounts of each must be maintained.

Abnormal variations in the amount of some of these autacoids are known to speed up or slow down certain cell activities with a corresponding alteration in the basal metabolism. It has been possible, therefore, to explain many metabolic diseases like myxedema, acromegaly, and exophthalmic goitre, by alterations in the quantity or character of the secretion produced by an endocrine organ.

No factors other than the autacoids have yet been discovered which are known to influence basal metabolism, with the possible exception of the toxins in fevers. Therefore it seems logical to reverse the accepted theory and, except in the case of infections, to suggest the tentative hypothesis that a variation of the basal metabolism beyond normal limits is due to an abnormality in the secretion of one or more of the endocrine organs. The particular autacoid must then be sought for by the elimination of those autacoids, variations of which produce well-known signs and symptoms.

This hypothesis allows a clear-cut division to be made between diseases in which the metabolism is increased, decreased, or remains normal, together with the probable cause of the disordered metabolism. Such a division is fundamental because it is made on an accurate knowledge of the rate at which the body cells are actually living.

Important as is the diagnostic value of metabolic studies in endocrine disorders, of no less importance is their value in determining the proper method of treatment, since conditions of over- or under-activity require different therapeutic measures. The determination of the basal metabolism before, during, and after treatment will give

in mathematical terms, easily understood, the value of that treatment. It will indicate whether the procedure has been beneficial or, on the other hand, harmful.

Diseases of the thyroid gland, with their extreme variations in the basal metabolism, afford a most striking example of the significance of metabolic studies. Furthermore, the connecting link between the etiological cause and the clinical picture is, in these diseases, most evident. In conditions of thyroid overactivity the metabolism may increase to one hundred per cent above normal, and in conditions of underactivity it may be decreased to fifty per cent below normal. Moreover, we have found that the patient's condition, judging from the sum total of the objective and subjective symptoms, corresponds very strikingly to the numerical expression of the basal metabolism.

As to the surgery of the thyroid, Lahey believes that by the addition of scopolamine or morphine to local anesthesia he has a method which is safer than any other. He reports 59 consecutive cases without a death and four anesthetic failures, in that ether was given in two cases, and should have been given in two more. Two required gas. He believes that the veronal, scopolamine, morphine, novocaine and adrenalin sequence is the ideal method for operation upon the thyroid gland. His method is as follows: At eight o'clock of the night previous to operation, ten grains of veronal are administered. On the next morning, two hours previous to the time of operation, 1/200 of scopolamine and from 1/6 to ¼ of morphine are administered hypodermically. One hour later, provided stertorous respiration, irregular pulse, or excitation have not appeared, this dose is repeated. At the time of operation, one hour later, if the patient is not soundly sleeping, 1/400 of scopolamine without morphine is administered. The solution of novocaine is then prepared. A 2-per-cent solution of novocaine containing 15 minims of adrenalin to the ounce has proven in his hands most satisfactory. One rarely needs to use more than ½ ounce, and no untoward symptoms have occurred in this series of cases, either from novocaine of this percentage or from the administration of morphine and scopolamine.

Seymour reports on the treatment of Graves's disease by the Roentgen ray, stating that uniform results have not been obtained until recently. It is a well-established fact that the highly specialized epithelial cells are the first to succumb to the action of the Roentgen ray, and, furthermore, the more closely these cells approach the embryonal type the more easily is their destruction accomplished. Therefore, when the pathological histogenesis of the thyroid and thymus gland in Graves's disease is borne in mind, it can readily be seen that in the Roentgen ray we possess a therapeutic agent of undoubted efficacy in the treatment of this disease. He has at the present time under treatment at the Massachusetts General Hospital 144 cases of Graves's disease, many of them since August 1, 1915. The average number of treatments received has been four. Of 80 cases, eight were absolutely cured of their symptoms. Nearly all have gained in weight. The average gain has been seven pounds, one case having gained twenty-five pounds. The average dosage has amounted to about 4H., which equals 5 Holziknecht or 10 x Kienbock or 1B Sabouraud-Noire. This is the dose necessary to produce a slight erythema. It is advisable, however, to keep just below the erythema dose. The dose has not been repeated inside of three or four weeks.

Porter notes that there are two types of goitre with different symptoms, those in which a goitre has been present for a variable length of time, followed by toxic symptoms with or without exophthalmos; and, perhaps the true type of primary Graves's disease, in which general toxic symptoms not rarely precede or quickly follow the development of an enlarged thyroid.

In many infections an inflammatory process develops in the thyroid gland, which usually subsides under simple treatment and

occasionally goes on to definite suppuration. It is treated as infection elsewhere.

A simple diffuse bilateral hyperplasia, or hypertrophy, of the gland occurs very frequently in girls at or near the age of puberty; not rarely after marriage, or during pregnancy. These hypertrophies usually disappear spontaneously, or through general medical treatment, iodine, thyroid extract, and *x*-rays.

Fetal adenomata occur as single or multiple, nodular, circumscribed tumors in one or both lobes, developing early in life, or at any period. They lead often to marked deformity, to pressure on the trachea or esophagus, depending upon their location. They are often accompanied by toxic symptoms; rarely by exophthalmos. The operation consists of either enucleation of the nodules or lobectomy.

Cysts are fairly common, and into these cysts hemorrhages occasionally occur and may cause acute development of alarming pressure symptoms. The harmful effects of cysts aside from this are purely mechanical. Aspiration with a hypodermic needle is indicated for diagnostic purposes, followed, if deemed advisable, by the injection of carbolic acid, corrosive sublimate, or some irritant designed to prevent recurrence.

Colloid is the commonest form of thyroid enlargement. Surgery here fulfils one of its safest indications. Local anesthesia is to be preferred where the mental attitude of the patient is satisfactory. Sulphonal 20 to 30 grains the afternoon previous to operation, and one or two doses of morphine, commencing an hour and a half before the operation, are indicated; with the second dose, 1/120 of a grain of scopolamine, which may be repeated just before operation, if the patient is not sufficiently drowsy. Occasionally these drugs seem to produce a condition of coma vigil, the patient sleeping until the surgeon starts to do something, then waking up and resisting. The patient should be carefully posed before operation; 1 to 2 per cent novocaine solution with 1:40,000 adrenalin chloride is indicated as a local anesthetic. A deep massive infiltration is driven in at the posterior mid-portion of the sternomastoid muscle to catch the nerves supplying the front and the side of the lower neck; this in addition to the skin infiltration in the line of transverse incision. The skin and platysma are dissected to the border of the thyroid cartilage and to the top of the sternum. The sternomastoid is dissected free and retracted. The sternothyroids may be separated or cross-cut. Lobectomy is comparatively simple and bloodless. The gland is dislocated toward the median line and the vessels clamped. Large, irregular tumors should be divided and two halves separated from the trachea from within outward. The lower rather than the upper pole should be left behind. In general drainage can be omitted. If drainage is used it should be removed at the end of two days.

As for malignant diseases when the diagnosis is assured operation offers practically no hope.

Porter has not been impressed with *x*-ray results in so far as the toxic cases are concerned. Rest and medical treatment are indicated here as a preliminary.

From the many useful deductions from these studies it would seem that our conception of thyroid function is widening, including particularly a psychic relation, which clinical evidence has so largely suggested, and a susceptibility to stimulation both emotionally and by adrenalin. A definite crystalline body has been isolated from the thyroid which when administered causes all the thyroid symptoms except tachycardia, and also this one if amino acids are provided at the time of administration. Experimentally removal of a thyroid overacting because of excessive sympathetic stimulation saves life. The study of basal metabolism is of importance in determining the factors underlying marked departures from normal and in indicating the desirability of immediate or remote surgery and the prospects of cure afforded by intervention.

REPORTS ON THERAPEUTIC PROGRESS.

CHEMICAL STUDIES ON A CASE OF BICHLORIDE POISONING.

The *Bulletin of the Johns Hopkins Hospital* for July, 1916, contains a report on this subject by LEWIS. He reaches these conclusions:

1. The necessity of prolonged and vigorous treatment of every case of bichloride poisoning cannot be too strongly emphasized. Many apparently moribund individuals have been saved by properly directed and vigorously pushed therapeutic measures. Death should be the only indication for a discontinuance of treatment prior to the complete recovery of the patient.

2. Retention of waste nitrogen is undoubtedly a factor in the early fatal issue of these cases. There are rarely any signs of uremia. The protein-sparing powers of the carbohydrates are of the greatest value in delaying the appearance of the extreme grades of nitrogen retention which usually precede death. If carbohydrate cannot be retained by mouth, glucose may be given intravenously in a 10- to 50-per-cent solution. In addition to its protein-sparing action, the glucose itself acts as a mild diuretic.

3. It is probable that alkalies have a decidedly beneficial action. Macnider has recently pointed out that they are capable of protecting the kidney from the full effects of uranium intoxication. It is possible that large doses of sodium bicarbonate given intravenously soon after the taking of the poison would exert a similar protective action in bichloride poisoning. The diuretic action of the alkalies is well known.

4. There is a very close agreement between most of the functional tests. Closer examination, however, shows that tests of retention or of elimination alone do not reflect the actual state of renal function as accurately as do these tests, which compare the rate of excretion of various substances in the urine with the concentration of the same substances in the tissues of the body. The coefficient of urea excretion and the phthalein test can be depended on to give more accurate information regarding certain phases of renal function (the excretion of nitrogen and water) than can be obtained either from the determination of the level of the T. N.-P. N. in the blood or of the amounts of nitrogen excreted in the urine.

5. The specific gravity curve is a valuable index of renal function. Fixation of the specific gravity is seen only at the height of renal insufficiency. The variations in the concentration of the urine become more and more marked as renal function approaches normal.

6. The acute course of the intoxication is shown by the functional tests. Even after six days of anuria, the kidneys regained a practically normal functional capacity within twelve days of the reëstablishment of urinary secretion. All trace of anatomical damage disappeared from the urine in less than three weeks.

7. The low value of the chlorides in the plasma explains the apparent retention of salt after the secretion of urine has been resumed. The retention is of the same general type as that seen in pneumonia. It is not due to any impermeability of the kidney to sodium chloride.

8. The lowered tension of the alveolar CO_2 would seem to indicate the presence of an acidosis during the early stages of the intoxication.

OBSERVATIONS ON THE INFLUENCE OF ANESTHETICS ON THE TEMPERATURE OF THE BODY.

In the *Proceedings of the Royal Society of Medicine* for May, 1916, PEMBREY and SHIPWAY state that during short operations of slight severity the necessity for precautions against the loss of heat is not urgent, for in an adult there is, owing to the mass of the body, a reserve of heat which is not rapidly dissipated in a hot theater. In such cases the advantages of warm ether, as

compared with cold ether, may not be so apparent. On the other hand, in the case of long operations upon a patient possessing a low resistance, the difference may be of great practical importance.

The "open method" used is that in which ether is dropped continuously on to some fabric spread over the Schimmelbusch mask, which is so closely applied to the face that the whole of the respiratory current passes through the fabric; when warm ether is given the end of the tube from the apparatus is placed under the mask and the ether vapor, warmed by passing through warming bottles, is pumped in at each inspiration. In most cases two layers of washed domett, in the remainder about twelve layers of gauze, have been used, and the mask has rested upon a shaped pad of flannel. With this method the temperature under the mask through which the patient is breathing varies from 48.2° to 78.8° F. with cold ether, whereas with warm ether it is about 89.6° F. A patient breathes about 5 liters of air per minute, and the expired air is raised to 96° F. or thereabouts. It is obvious, therefore, that more heat must be lost from the respiratory tract, although the expired air with cold ether may not be warmed to the same extent.

With such an "open method" as the one just described the writers have never observed a lower temperature in the inspired air under the mask than 48.2° F., the temperature of the air of the theater being 77° F., and they think that some explanation is necessary for the exceedingly low temperatures recorded by some observers. It is necessary to remember that the air in the mask is being warmed constantly by the skin of the face and every few seconds by the expired air. For example, with a Schimmelbusch mask of two layers of domett and a pad placed over the face, the temperature of the air was 91.4° to 93.2° F. five minutes after the mask had been placed over the face, the temperature of the room being 71.6° to 73.4° F. The mask and pad were removed from the face and ether dropped upon the domett as during an administration—the temperature of the air fell to 32° F.; they were immediately placed over the face, and within one minute the temperature of the air rose to 61.7° F.

As regards the temperature of the body, observations of the rectal temperature are necessary, for the determinations in the mouth are unreliable both before and especially after an administration of an anesthetic. The surface temperature of the skin may rise under the influence of ether owing to dilatation of the cutaneous vessels, and thus increase the loss of heat so much that the internal temperature falls. With warm ether the loss of heat from the skin can be more readily compensated.

The following points are of practical as well as physiological interest in connection with the influence of anesthetics upon the temperature. The excitability of the medulla is increased by a rise, diminished by a fall, in the internal temperature; this effect upon the respiratory center is well known, and in a pronounced form is seen in heat polypnea or dyspnea. The heart is stimulated by warmth, and the exchange of gases between the blood and the tissues is facilitated by a rise, delayed by a fall, in temperature.

A normal man reacts to external cold by diminishing his loss and increasing his production of heat; the anesthetized man, paralyzed for sensation and movement, has lost this control, and the level of the chemical changes, which are a measure of vital activity, can be maintained only by external warmth. This loss of control involves also the possibility of an abnormal rise in the temperature of the patient if he be exposed to excessive heat.

A great practical advantage of the warm ether is that it enables the surgeon to operate in a cooler theater; the ideal must be to keep the patient warm enough without exposing the staff to the depressing effect of high temperature. Apart from diminished efficiency and endurance, a warm and moist atmosphere introduces the

danger of the sweat of the surgeon undoing the elaborate precautions taken to preserve aseptic conditions. With an operating table warmed by an electric heater or some other safe method, it should be possible to operate in a theater of moderate warmth.

The "open method" is not strictly an open one. The mask placed upon a pad over the face confines the air to a considerable extent; this is shown by the determinations of the moisture and the carbon dioxide in the air space. Thus the dry wet bulb thermometers recorded 88.7° F. and 86° F. under the mask, and waved in the air of the room 72.5° F. and 65.3° F. The breath moistens the air and thus obviates the necessity of adding moisture to the air laden with ether vapor. The amount of carbon dioxide may be 3 or 4 per cent of the total 250 Cc. of air under the mask; there is, according to the closeness with which the mask is applied to the face and the thickness of the material, a certain amount of rebreathing which may be an advantage when the stimulating effect of carbon dioxide is required.

THE RAPIDITY WITH WHICH ALCOHOL AND SOME SUGARS MAY SERVE AS NUTRIMENT.

HIGGINS in the *American Journal of Physiology* of August 1, 1916, reaches these conclusions:

1. By determination of respiratory quotients in periods of three and four minutes' duration upon subjects without breakfast, it was concluded that:

(*a*) Alcohol begins to be burned in appreciable quantity in from five to eleven minutes after taking; with some subjects the combustion began more quickly than with others.

(*b*) Sucrose, lactose, and levulose begin to be burned quite as soon as alcohol, if not sooner.

(*c*) Glucose and maltose are not utilized as food as soon as the other sugars or alcohol, approximately twenty to thirty minutes elapsing before their combustion plays an important part in the metabolism.

2. There is a distinct difference between the metabolism in men of glucose and of levulose and galactose as shown by a study of the gaseous exchange, especially the respiratory quotients.

ADVANTAGES NOTED IN THE USE OF McDONALD'S SOLUTION AS AN ANTISEPTIC.

In the *United States Naval Medical Bulletin* for July, 1916, STALNAKER shows the relative merits of McDonald's solution and tincture of iodine as evidenced by the continuous use of both solutions extending over a period of several months:

McDONALD'S SOLUTION. *Formula.*	TINCTURE OF IODINE. *Formula.*
Pyxol ..... 2 parts. Acetone .....40 parts. Alcohol .....60 parts. Applied same as tincture of iodine.	Iodine .....7 per cent. Pot. iodid.....5 per cent. Alcohol .....100 Cc.
Advantages and Disadvantages.	*Advantages and Disadvantages.*
1. Disinfects quicker and better than tincture of iodine. Estimated as 20 times more efficient than phenol.	1. Is not as good a disinfectant as McDonald's solution.
2. Does not injure metal instruments. Instruments can be left in this solution for weeks without injury or corrosion.	2. Injures metal instruments.
3. Costs much less than tincture of iodine.	3. Costs approximately 66 2/3 per cent more than McDonald's solution.
4. Lesions heal more rapidly.	4. Lesions do not heal as rapidly.
5. Ingredients readily procured in United States. The slogan "Made in America" is applicable here.	5. Ingredients harder (since European war) to procure in United States. Foreign firms practically monopolize the trade.
6. Does not injure the skin to apply watery solutions following applications.	6. Injures skin and causes desquamation if watery solutions follow use of tincture of iodine.
7. Not necessary to protect serous covering, as peritoneum, following use.	7. Is necessary to protect serous coverings following use.
8. Evaporates rapidly.	8. Does not evaporate as rapidly.
9. Does not injure the skin.	9. Injures the skin.
10. Does not stain skin.	10. Stains skin.
11. Equally inflammable.	11. Equally inflammable.
12. Not as good as counter-irritant.	12. Much better counter-irritant.
13. Pleasant odor.	13. Not a pleasant odor.
14. Feels cool to the skin surface.	14. This cooling effect is not noted.
15. Splendid to cleanse and cut greasy particles from dirty wounds.	15. Action practically *nil* in this respect.

The above are the most salient differences noted in the use of these two solutions. The balance is greatly in favor of McDonald's solution. In compound com-

minuted fractures dressed in McDonald's solution the results have been highly satisfactory and better than could have been expected if tincture of iodine had been used instead.

It does more efficiently the work we now generally require several solutions to do—*i.e.*, tincture of iodine, liquor cresolis comp., phenol, bichloride of mercury, etc.

McDonald's solution is unhesitatingly recommended for general service as a substitute for tincture of iodine and other antiseptics now in general use.

THE MANAGEMENT OF VASOMOTOR DISTURBANCES OF THE UPPER AIR-PASSAGES.

GOODALE in the *Boston Medical and Surgical Journal* of August 10, 1916, asserts that in a large proportion of vasomotor diseases of the upper air-passages the disturbances are dependent upon the entrance of a foreign proteid into the system. The method of entrance may be through the contact of the proteid in question with mucous membranes of the respiratory or of the gastrointestinal tract by inhalation or ingestion respectively. Foreign proteids may perhaps also develop in or upon these mucous membranes through autolysis of pathogenic or saprophytic bacteria. The application of the skin test to these conditions is of diagnostic value when employed with a recognition of the phylogenetic relationships of animals and plants, as determined by studies in serobiology.

Proteid material for testing should be prepared both from the keratin and sera of domestic animals, from the pollen of the chief causes of hay-fever, and from the various articles of food which enter commonly into the diet. Bacterial proteids derived from the various invaders of the respiratory tract should be available either in solution or in soluble form.

When the skin reactions to the various classes of pollen proteids have been determined, the management of cases will depend largely upon the relative preponderance of the local reactions in relation to the clinical history. If the cause is found to be seasonal, as in hay-fever, immunizing treatment by injection of pollen extracts is likely to prove of service. The sensitization returns during the following winter, and treatment must probably be repeated annually. If the cause is perennial and is due to inhalation of foreign proteids, it is wiser to avoid the cause rather than to seek to effect a cure by immunization. If the disturbing proteid enters into the ordinary articles of diet, a tolerance may be gradually established by feeding the substance in progressively increasing doses. Disturbances of bacterial origin have not yet been sufficiently studied to enable the formulation of a definite plan of treatment; but the results of these investigations confirm our present methods of treatment, and emphasize the importance of draining regions which can retain the products of bacterial activity. Septic foci should be removed. Vaccine therapy is likely in such anaphylactic cases to be more accurately guided than in the ordinary individual.

The results already accomplished in the case of this clinical investigation have led Goodale to the conclusion that we possess in the intelligent application of the skin test a very definite aid in the diagnosis and consequent management of our cases of vasomotor disturbances of the upper air-passages. We are as yet only at the entrance of this field, and its exploration must be carried out by the coöperation of laboratory workers in chemistry and serobiology.

THE QUARANTINE PERIOD FOR MEASLES.

WHYTE in the *Canadian Practitioner and Review* for August, 1916, states that from the evidence which he is able to gather together, it would seem to be generally accepted that straight, clean cases of measles are infective only for a very short time, and personally he believes that this applies not only to clean cases, but also when complicated by chronic discharges from the

nose and ears. All are agreed that the most infective period of measles is the invasion and early eruptive period. But as most cases are well into the eruptive stage before being seen by the medical profession, any measures decided upon to cope with the situation should be directed toward the control of the movements of contacts rather than to prolonged isolation of the original infecting case. Quarantine and observation of contacts for fourteen days from the date of the last exposure to the original case would seem to be the only effective measure in preventing the spread of infection from house to house. If it were possible to provide a routine examination of patients for Koplik spots during the second week of quarantine many cases could be spotted and put under strict isolation during the very period when such a measure is of some value.

Prolonged quarantine of the original infecting case probably has no bearing upon the prevention of the spread of infection, but the danger of subsequent cases developing within fourteen days is the more important detail in any effort to control the disease. If any results are to be expected in the quarantine of measles, Whyte believes they will be obtained more surely by eliminating unnecessary hardships in the way of prolonged quarantine of the original case, and by more rigid control and observation of contacts, especially toward the close of the incubation period.

MEDICAL TREATMENT OF GASTRIC AND DUODENAL ULCER.

TURCK in the *Medical Record* of June 24, 1916, says that the United States ought to be able to give the best résumé on the value of surgical operation in all forms of peptic ulcer, for there seems to have been no hindrance to the operative attempts to cure ulcer of every form. Indeed, operative procedures for the relief of ulcer have assumed almost a national passion, in which the internist has acquiesced because of the inadequacy of the usual methods to obtain curative results. Because of medical failure we should not cast the responsibility on the surgeon, who, only too often, adds a surgical failure. In 1906 the late Nicholas Senn, Dean of American Surgeons, in a manuscript communication now in Turck's possession, did not hesitate to crystallize definitely the results of his experience. "I regard ulcer of the stomach," he writes, "a strictly medical disease and treat it as such. The only indications for surgical interference are obstructions from cicatricial contraction and dangerous hemorrhage. I look upon gastroenterostomy in all other cases or any other surgical procedure as irrational treatment and one that is liable to be followed by grave remote disturbances of digestion by making a physiological exclusion of the most important part of the intestinal canal and by establishing an abnormal opening between the stomach and the intestinal canal."

Ten years have passed in which surgical endeavor has had its greatest vogue. And now the pendulum swings back again and the words of Senn are echoed by Sir John Bland Sutton. In his Hunterian lecture in February of this year, he observes that "since the treatment of duodenal ulcer passed into the province of surgery it has become the routine practice to perform gastroenterostomy." He protests that "this procedure is inefficient with a patent pylorus, for the chyme ignores the new stoma, as the *x*-rays readily demonstrate. Again, if the pylorus is obstructed, the chyme passes directly into the jejunum, where a remarkable transformation occurs. The wall of the jejunum receiving the impact of the chyme ejected through the new stoma becomes attenuated, the valvulæ disappear, and the jejunal walls assume the peculiarities of the supra-ampullary segment of the duodenum. This change entails the liability of jejunal ulceration so commonly found; thus a new ulcer has been evolved in this generation by alterations in the environment of the jejunum brought about by surgery." As Turck has shown, the evidences are fast accumulating, and give weight to the state-

ment that operation should be reserved for those cases in which it is clearly indicated because of mechanical obstructions, not functional resistance. The cure of ulcer remains a biological or physiological problem.

To the clinician the cure is a very practical problem as well; acute symptoms are to be alleviated, the body strength is to be maintained, and eventually the digestive function is to be restored to normal. It is unfortunate that the medical treatment of ulcer has largely been a matter of a routine, not merely because the healer should adapt his procedures to the daily progress of the patient, but because many of the routine diets are both theoretically faulty and clinically unsatisfactory. The common procedure, for example, is to institute, after a short period of fasting, a diet of cold milk and eggs in small quantities every hour. These amounts are gradually increased, with the addition, during the second week, of sugar, rice, scraped beef, raw ham, and butter, as advocated by Lenhartz.

To this Turck's experience bids him take exception on several points. First, he opposes frequent feedings with the system of the one- and two-meal day, for it has been found that small quantities in an atonic stomach remain nearly as long as large amounts, while at each taking of food fresh stimulus to the flow of HCl is induced. Again, the addition of food to a stomach which may already contain partially digested material is certainly non-physiological. With the two-meal system the caloric need of the body is better satisfied, and incidentally the patient's appetite and general comfort are spared the insult of an interminable series of feedings.

As regards the food given, he has felt that eggs are not well borne, from their tendency to putrefy in the intestine just at the time when it is most desirable to maintain adequate function of the colon. Among the split products of lecithin are highly toxic cholin and neurine, to which many patients seem to be very susceptible. Milk, as a dietary basis, does not enter his scheme of treatment; its clotting in the acid stomach delays emptying, while the casein serves too readily for pabulum to the intestinal flora. When peptonized it is unpalatable in the extreme, and indeed patients, in most cases, rapidly develop a repugnance for milk in any form when pushed to the extent necessary to give even a moderate share of the caloric requirement. Furthermore a milk diet contains a quite unnecessary excess of fluid, and is frequently followed by a distressing amount of gas in the intestine with abdominal distention.

To make his position clear, Turck proposes to outline a method of treatment capable of broad adaptation to the mildness or severity of the individual case, yet concrete and definite enough to illustrate his principles and his purpose.

It is now desirable to give in some detail the means employed in this method of treatment with a discussion of the scientific basis and practical aim of each. Rest in bed is required for the first two weeks and advised for the third. There is a preliminary period of three days' fast, during which small amounts of water may be allowed. On the fourth day a single meal of about 800 Cc. of corn-starch gruel is allowed; following this the patient is given two meals a day with gradually increasing amounts of rice, steamed vegetables, and hydrolyzed meat. Naturally the diet must be adapted to each case and changed to suit the symptoms which may come out under treatment. When meat is allowed early in the second week, the extractives must first be removed by soaking the ground meat in cold water for twelve hours, then by pressing out the juice and discarding it.

The indication for this removal of meat extractives is the gastric hyperchlorhydria, for it has been demonstrated that their presence has a definitely stimulating effect on acid production. The meat pulp that remains is placed in boiling water and steamed for one or two hours until the connective tissue is hydrolyzed to gelatin,

the larger part of extractives removed, and the stearin fat, so difficult of digestion, is driven off. This process leaves a meat residue of rich protein value (50 per cent), very digestible, and of high acid binding power; it is rapidly absorbed, leaving no protein residue to augment bacterial growth in the intestines. Vegetables, similarly, should be steamed for two or three hours, to render them demulcent to the stomach and lessen the tendency to intestinal fermentation. When so treated, vegetables do not lose their alkaline properties nor their caloric value as when boiled; and aside from their nutrient value act as a colloidal paste on the mucosa of the gastrointestinal tract.

OUTLINE OF TREATMENT.

DIET.	TREATMENT.
Week.	
1. 1 day, 2 day, 3 day } *Fasting. Rest in bed.* Analgesic emulsion before feeding.	Aspiration of gastric fluid 1 hr. each day. Filter washed with $NaHCO_3$. Alkaline powder 3¼ when required with water.
4 day, 5 day, 6 day } 1 meal 800 Cc. cornstarch gruel to be sipped in one hour after morning lavage.	Lavage with $AgNO_3$, 1:10,000 left in 1½ minutes. Washed with green soap. Alternate days.
7 day, 2 meals of rice, steamed vegetables and mashed potatoes.	Colon stimulation with pneumatics. Alternate days.
Week.	
2. *Rest in bed.* Two meals a day of rice custard, mashed potatoes. *Vegetables* steamed 3 hrs. under pressure, hydrolyzed to paste.	Aspiration every day. Colon stimulation. Alternate days. Lavage with Ag NO_3 1:2000 (500 Cc.) for 1½ minutes. Alternate days. Alkaline powder when required.
Meat (small amounts) chopped fine and extracted in cold water for 12 hrs., steamed to hydrolyze connective tissue and remove extractives, also to drive off stearin fat. Minimum of milk and eggs. Sugar allowed. Keep up calories.	
Week.	
3 & 4. *Rest*, not necessarily in bed. Increase food amounts gradually, still insisting on hydrolyzed meat and vegetables.	$AgNO_3$ lavage and colon stimulation only at intervals. Vaccines of *B. coli communis*. Autogenous, sensitized to patients' serum. Start with 50 million, watch reaction, increase doses every 6 days. Iron and iodides if needed. Gastric exercise by double tube insufflation of hot moist air with aromatics, and hot water intragastric bag 115 deg. x 800 Cc. Thyroid gr. ¼ three times a day. Pituitrin if indicated. Colon stimulation twice a week.
Week.	
5. Get out into sun and open air. Stimulate interest and appetite.	

USE OF EIWEISSMILCH.

MEININGER in the *Archives of Pediatrics* for July, 1916, states that the conclusion of the majority of observers has been that dyspeptic conditions in infants are an induced intolerance for carbohydrates in the intestines producing abnormal fermentation. Some years ago it was the general opinion that all acute gastrointestinal conditions were due to an infection of the intestinal tract. Finkelstein, and later others, offered proof of the fact that whereas a small percentage are due to an infection, the large, and very large, majority of these cases are primarily due to intestinal harm caused by relatively high carbohydrates with an overstepping of food tolerance.

The frequent acid, green, explosive stools are caused by whey concentration with the fermentative bacteria acting on the carbohydrates and mucus. These stools waste the potassium and sodium salts with a consequent demineralization and relative acidosis, which adds to the toxemia. There is also a large water loss, depending on the type of child.

Now in feeding eiweissmilch, with its large protein content, and adding to it a sugar which is not easily fermented, we get, instead of a pathologic fermentation, a condition of putrefaction, which changes the acidity of the intestinal contents to alkaline. The peristalsis is decreased, with the resulting absorption of fluid and the excretion of soapy, clay-colored, constipated stools of eiweissmilch.

In conclusion, Meininger would say that eiweissmilch is a dietetic measure which is reliable and cures most cases of intestinal derangements in a short time. It insures a sufficiency of food, so that the weight of the infant is considerably increased during its treatment, which was not the case when we were in the habit of treating these conditions with gruels and flour, which is a hunger diet, and with which results are obtained in spite of the carbohydrate because of the small amount of the diet given.

The chief benefits of the food are a re-

duction of fermentation in the intestines and a substitution for it of putrefactive changes leading to the characteristic calcium soap stools and with cessation of diarrhea and a gain in weight.

The reason favoring this change is, according to earlier publications, due to the high percentage of proteid and low percentage of salt and of milk-sugar.

The theory given by some of late is that the diminution in salt and sugar and fat is of minor importance, and that the feature of albumin milk essential to its success is the high content of proteid and calcium.

ON THE COMPARATIVE TOXICITY OF MORPHINE AND MORPHINE-NARCOTIN (NARCOPHIN).

In the *American Journal of the Medical Sciences* for July, 1916, MACHT reports a long series of experiments on animals and reaches these conclusions:

1. The comparative toxicity of morphine and narcophin was studied on various animals: pigs, fish, terrapin, mice, rats, guinea-pigs, rabbits, pigeons, cats, and dogs.

2. It was found that in general the toxicity of narcophin is about the same as the same weight of morphine.

3. Narcophin consists of one-third its weight of morphine meconate and two-thirds its weight of narcotin meconate. Inasmuch as the toxicity of narcotin is very low, we have here a distinct potentiation of the toxicity of morphine.

4. It is, therefore, not advisable to administer narcophin clinically in doses larger than those of morphine.

THE FASTING TREATMENT OF DIABETES.

In the *British Medical Journal* of June 17, 1916, SPRIGGS reports cases treated by this method. He believes that much time will be needed before a seasoned judgment on the fasting method can be given. At the present time he summarizes his observations as follows:

Fasting, up to several days, was well borne by cases of mild and severe diabetes of ages ranging from twenty-four to seventy-nine.

The urine was made free from sugar, the blood sugar was reduced, and acidosis greatly diminished.

All the patients felt better for the fast.

In most cases the food could be increased gradually, without glycosuria, until a more liberal diet was being taken than before treatment..

The rapid abolition of sugar had an excellent mental effect. It shortened tedious treatment, and enabled more time to be given to finding out what food should be taken and in what quantity.

The gradual increase of food after the fast calls for skilled dietetic arrangements and careful daily attention. It is not so easy as an ordinary strict diabetic diet. It is useless, however, except in the mildest cases, to increase the food quickly after the fast, as sugar returns at once.

During the gradual increase of food the patient is under-nourished. In severe cases courage and endurance are called for on his part, as it may be necessary to keep him so short of food that he is inefficient.

Regular estimation of the blood sugar should be made. In some cases of diabetes as good an effect may be attained, though much more slowly, without fasting and subnutrition, with its risk of depression and weakness, provided the patient is willing to keep permanently to the diet which has been found by careful testing to be suitable to his case.

At the present time the doctor, in order to decide as to the best treatment in severe cases, must judge of the temperament of the patient. To some it is purgatory to be continually having to think about tests and figures. These will do best with definite allowances in an otherwise rigid diet. In others the disadvantages of a half-starved condition must be balanced against the mental effect of the absence of sugar. Spriggs does not yet know whether the progress of the disease is arrested by this method in cases in which it would not be

arrested by a permanent adherence to a rigid, though plentiful, diet.

For all milder cases, indeed for the majority of all cases, the starvation procedure offers great advantages. There is evidence enough that such patients, though not cured, may be freed from the signs and symptoms of their complaint.

PULSE-PRESSURE AS A MEASURE OF CIRCULATORY EFFICIENCY.

In the *Journal of the Iowa State Medical Society* of July 15, 1916, BIERRING reaches these conclusions:

1. A comparatively low systolic pressure with a comparatively high diastolic pressure and a consequently small pulse-pressure may mean myocardial weakness with chronic nephritis, arteriosclerosis, chronic toxemia, or arterial spasm.

2. A low diastolic pressure with a comparatively high systolic pressure and an excessively large pulse-pressure may mean several things—*i.e.*, a purely functional condition, a compensated aortic insufficiency, myocardial degeneration without much arteriosclerosis, or chronic nephritis, or vasodilatation from any cause.

3. The diastolic pressure seems to be more stable than the systolic, and the movement of the diastolic pressure beyond the normal range seems to be a sufficient cause for enlargement of the pulse-pressure if an adequate circulation is to be kept up.

4. A low systolic pressure, provided the diastolic pressure is sufficiently low to provide an adequate pulse-pressure, does not necessarily mean poor circulation, though it does seem to imply a diminished reserve power of the heart.

5. A systolic pressure of 100 or lower in an adult or a diastolic pressure of 100 or higher suggests disease, and may call for treatment.

6. A pulse-pressure as small as 20, or as large as 60, if persistent, may be pathologic.

7. Chronic nephritis seems regularly to be attended by a high diastolic pressure and a large pulse-pressure which is adequate so long as the myocardial reserve power holds out.

8. Arteriosclerosis, as a rule, seems to produce marked elevation of the blood-pressure only when the blood supply of a vital organ is disturbed or when the aorta is affected.

The effect of therapeutic procedures on abnormal blood-pressures must be interpreted in the light of several facts, notably the following: The elevation of the blood pressure, both systolic and diastolic, as well as diminution of pulse-pressure, is more regularly symptomatic.

Therapeutic procedures to correct abnormally high blood-pressure, in order to be rational, should be directed as far as possible to removing the causes of the abnormal pressure, and only in exceptional cases should the treatment of high blood-pressure be symptomatic, viz., when continuance of existing high pressure threatens accidents to the cardiovascular apparatus.

In the treatment of abnormally low blood-pressure, a removal of the causes as far as possible should be attempted, and also, more generally than in high pressure, symptomatic treatment may be given. The nitroglycerin test is useful in determining whether the hypertension is due to arteriosclerosis or chronic nephritis. It affects the latter condition, but not the former.

Many of the heart stimulant drugs do not seem to raise the blood-pressure, but even when they do not produce an elevation of the systolic pressure they often appear clinically to improve the circulation, suggesting that the efficiency of the circulation—that is, the movement of the whole volume of blood—does not depend altogether on the blood-pressure condition. It is conceivable that a drug which lowers the blood-pressure may improve the circulation by lowering the diastolic pressure more than the systolic, thereby increasing the pulse-pressure. Such may be the case with nitroglycerin.

The clinical significance of variations in the systolic and diastolic blood-pressures and the pulse-pressure is a particularly

difficult subject to deal with, both in its entirety and in its parts, not only because it is comparatively new and has not been thoroughly studied, but because of intrinsic difficulties. The possibilities of error in observation and of confusion of data are present in an unusual degree.

The neurotic factor in the patient and the personal factor in the observer require considerable allowance to be made in the interpretation of the blood-pressure findings and the estimation of therapeutic procedures.

The estimation of blood-pressure results must on no account be regarded as superseding or rendering unnecessary the use of other sources of information regarding the condition of the circulation. Error from misuse of the results of blood-pressure estimation, by blind adherence to mechanical standards, is easily avoided by common-sense application of other obvious signs taken in correlation with the blood-pressure data.

ETHER AND CHLOROFORM ANESTHESIA.

In the *Practitioner* for August, 1916, HUMPHRY says he thinks it is safe to begin an anesthesia with ether, and when the patient is very nearly under to give chloroform, but he does not think the much more common practice of starting with chloroform and suddenly giving a douche of ether on the mask during incomplete anesthesia is free from danger. In most instances nothing much happens; but there are two classes of cases in which very alarming symptoms may immediately supervene, and often terminate in more or less sudden death. These two classes are lymphatism and disease of the auriculo-ventricular bundles of His. Humphry understands, from others who know more about the latter condition than he does, that even the comparatively trivial excitation set up may be sufficient to cause ventricular fibrillation and sudden death.

In lymphatism, at certain times, if chloroform is being administered, and the patient is suddenly switched on to ether during incomplete anesthesia, Humphry is sure that this might be the exciting cause of very serious trouble, perhaps ending fatally on the operating table. In lymphatism, he does not know if ventricular fibrillation is the cause of the very sudden fatalities, but he thinks it may be possible in some cases, for there is usually present a well-marked fatty degeneration of the myocardium of the heart, and he expects there are, probably, degenerative changes in the nerves as well. He is sure that ventricular fibrillation does not account for many of the rather sudden fatalities in lymphatism, for he has seen several cases in which, as a result of shock, the respiratory symptoms suddenly became alarming some appreciable interval before the heart was affected, at a time when no anesthetic was being, or had been, given. Personally, he likes to give, as a routine, grain 1/100 atropine sulphate, with or without morphia sulphate grain 1/6 to ¼, hypodermically, one hour before the administration of ether, and often to employ, hypodermically, scopolamine or hyoscine hydrobromide grain 1/150 or 1/120, either by itself or with ⅛ to 1/6 of a grain of morphine, an hour before the administration of chloroform. He thinks the latter plan better than ether, etc., for soldiers suffering from "shell-shock."

GAS-OXYGEN ANESTHESIA AND ITS LIMITATIONS.

In *Colorado Medicine* for August, 1916, SEYBOLD points out that all anesthetics have their limitations, some more than others. While gas-oxygen is the safest, it is also the most difficult to administer, few being able to produce relaxation with it. We may, therefore, at times see some very discouraging results, and on first thought blame the anesthetic, when in reality it is the faulty technique that is to blame.

The doctor in charge of the anesthetic may have great skill with chloroform and ether and yet make a positive failure in this form of anesthesia. One who has not had experience with gas-oxygen is just as

much a novice, regardless of his experience with other anesthetics, as the young intern with his first case; in fact, his chance of losing the patient is greater. This is due to the fact that the danger symptoms with this anesthetic are so different from those we see from the other anesthetics.

Gas-oxygen cannot be considered safe except in the hands of one skilled in its use. In the hands of an expert nitrous oxide and oxygen anesthetist, however, there are very few contraindications to its employment. These contraindications are vitally important. They include:

1. Patients suffering from swellings in the throat such as we find in the advanced stages of Ludwig's angina.

2. Cases of extremely high blood-pressure in which the operative procedure will necessitate using the Trendelenburg position.

3. Poorly nourished children under five years of age whose air-way is blocked with enlarged tonsils and adenoids.

In the first case, an edema of the glottis may develop and the patient choke to death. In the second, that of the patient whose blood-pressure is very high and who is placed in the Trendelenburg position, there is danger of rupturing a blood-vessel within the brain, especially if the anesthetic technique be a little faulty, and the blood-pressure allowed to rise. The third case is a bad risk, from the fact that children under five years react very rapidly under this anesthetic. In a child having a low resistance and whose air-way is blocked, it is practically impossible to maintain an even anesthesia. Should the patient get a toxic dose and go into clonic spasms or for any reason stop breathing, the lowered resistance makes it very hard to resuscitate him.

The cases just described are such as Seybold has had to handle, and have proved to be the most difficult, having required "hair-line anesthesia," if he may use that term. To him the experience was like steering a high-powered racing machine down a very narrow lane where the slightest mistake meant death.

There are some who claim that this anesthetic cannot be used in abdominal work. This idea is due to the critic having seen bad cases in which the technique of the anesthetic was at fault.

ASTHMA IN CHILDREN: ITS RELATION TO ANAPHYLAXIS.

The *Boston Medical and Surgical Journal* of August 10, 1916, contains an article by TALBOT in which he tells us that during the course of the past three years the methods of determining the etiological cause of asthma have improved both in the technique and in the materials used in the tests. The skin test is performed as follows: A linear scarification is made about one-half inch long, and only deep enough to penetrate the outer layers of the skin, care being taken not to draw the blood. In each case an extra scarification is made as a control, because it is a well-established fact that the mechanical injury to the skin may result in a pseudo-reaction (an elevated white area surrounded by small roseola), especially in patients with an "exudative diathesis." The scarifications are then inoculated by placing the materials to be tested (preferably in fresh solution) on the scarifications, and watching them for twenty minutes. A positive reaction appears in from ten to twenty minutes, and in rare instances a delayed reaction is seen in one to two hours. A positive reaction gives an urticarial wheal with an irregular outline surrounded by a pink blush, both of these phenomena being absent in the control. In some cases the blush, without the urticarial wheal, is so pronounced that there is no question that there is a positive reaction. Itching may or may not be present. The reaction usually disappears within one-half to two hours. The more delicate the skin the more sensitive it is to foreign protein, and the more readily will it react when it is unbroken or only slightly broken. The skin of an infant reacts very readily, and even when healthy is capable of absorbing the foreign protein in some instances. When the skin becomes thicker and hardened by exposure, as in the male adult, it reacts less

readily, requires a more concentrated test solution, and a deeper scarification. Children and young women with delicate skins react almost as easily as do infants. The skin of the inner flexor surface of the arm is thinner and more sensitive than that of the outer arm, and for that reason is the best place to make the scarifications.

The materials used in the skin tests were at first watery extracts of cereals and expressed juices (whenever they could be obtained), and were prepared freshly in the office. Later the pure proteins of various vegetables, fruits, and nuts were prepared by Mr. Wodehouse working in the Botanic Garden at Harvard College, and found to be more satisfactory than the home-made product. They contain a more concentrated solution and do not deteriorate. Naturally, the scope of the investigation increased with the number of materials which could be tested, and the thoroughness with which the cases were studied increased with the materials prepared for the tests.

Of the forty-five cases in this series, there were thirteen in which the skin tests gave no clue to the etiological cause of the asthma. They were either not tested with the proper material or they were anti-anaphylactic. The difficulty of finding the cause of the asthma is shown by a case in which 38 tests were made before positive information was obtained.

Experience has shown that when a positive skin test is obtained for a food, and the food is then removed from the diet, the general condition of the patient almost invariably improves, and in many instances a cure results. In other instances it is necessary to induce an artificial immunity because of the difficulty in entirely eliminating the offending protein from the diet, as, for example, eggs or milk. Immunity may be induced in these patients by giving increasing doses of the offending protein as described by Schloss.

A definite etiological connection may be established between most cases of asthma and some foreign protein by the skin test. If an individual is sensitive to one protein he is also apt to be sensitive to other proteins. The large number of cases with family histories of asthma or food idiosyncrasies makes it seem probable that there is a hereditary predisposition to sensitization. Information given by the skin test is of inestimable value in outlining the treatment of the case, and with the use of this information marked improvement or cure often follows. Further study will undoubtedly add much to our knowledge of asthma and its allied diseases and will still further modify our conception of the processes involved.

SEBORRHEIC DERMATITIS.

CUNNINGHAM in the *Medical Record* of August 26, 1916, states that seborrheic dermatitis is quite amenable to treatment except upon the scalp, where it is difficult to make effective applications on account of the hair. On the body ointments of sulphur, resorcin, or ammoniated mercury, singly or in combination, are usually successful. Cunningham's results upon the body are in sharp contrast to those upon the scalp. This is the more regrettable because it is the ravages in the latter situation that are costly and disfiguring. On the non-hairy surface the lesions may be hidden unless the face is involved. And even in the latter contingency prompt response to treatment may be anticipated. But upon the scalp the disease presents two exasperating features: it destroys the hair and stubbornly resists the efforts made to cure it.

The destruction of the hair is disconcerting to both man and woman, for reasons that are perfectly obvious. The woman foresees the loss of her attractiveness; the man foresees the aspersion of waning efficiency. The former has methods of concealing the depletion; the latter rears his glistening pate in impotent despair. He is the subject of stupid raillery upon the traditional but undoubtedly apochryphal fondness of bald-headed men for advanced positions at spectacular theatrical performances. What association there can possibly be between waning hair and waxing sensuality has never been explained. It is prob-

ably nothing but a wicked invention of the professional humorist. These considerations are weighty enough to stimulate the doctor to earnest coöperation with the apprehensive patient for the preservation of his locks. What are the best means of accomplishing this laudable purpose? As the mill will never grind again with the water that has passed, so the scalp will never bloom with the hair that has departed. Once it has fallen out, under the blight of seborrhea, we may bid it a fond farewell. Much may be done, however, to stay the devastation and tenderly nurture that which is left.

On the scalp lotions are preferable to salves, because of the aversion to greasy heads in most civilized assemblages. It is fair to admit that the results leave much to be desired. Factors responsible for this are the complicity of accumulating years in the attenuating process; and the disinclination of the average patient to make an uphill fight in the face of trivial encouragement. But persistence will win here as in any other field of human endeavor, if it is intelligently guided. Lotions should be applied with a medicine dropper directly to the scalp and rubbed in gently but steadily for about fifteen minutes. Energetic action will precipitate the falling of those hairs already loosened by the disease. Washing the head should be restricted to the demands of decency. It should not be undertaken under the delusion of assisting the cure, for water is decidedly objectionable, unless properly medicated. On these rare occasions a good brand of tar soap should be used. The lotion most in vogue is composed of resorcin 10 per cent in alcohol and water. Glycerin may be added if the hair is dry. The proportion of alcohol and water may be varied to suit individual requirements. If resorcin proves unsatisfactory bichloride of mercury may be substituted in the same menstruum. One grain to the ounce will be a fair average strength. If another essay is demanded a one-per-cent solution of lysol is helpful. It has the disadvantage of being malodorous. This may be mitigated by oil of bergamot. If lysol proves offensive or inefficacious betanaphthol 2 per cent in alcohol and water is worth a reasonable trial. Some cases will not yield to lotions, and in order to stay the falling hair recourse must be had to the ointment of ammoniated mercury 5 per cent. It will not be prudent to exceed that proportion. It is to be applied only at night, and the hair may be wiped off with a towel in the morning.

The changes may be rung on the remedies, and sulphur may be cautiously combined. But this sums up the profitable procedures in any case of seborrhea. In these days of bold experimentation the *x*-ray was certain to be turned upon the scalp for the relief of this alarming denudation. It may be affirmed in all fairness that it offers no better prospects than the chemical applications, if it is used with discretion and restraint. If pushed beyond the bounds of prudence it will cause a complete alopecia, which may or may not be permanent, and which may be followed perhaps after a lapse of several years by all the disfigurement and hazard of an *x*-ray burn. It is "better to bear those ills we have than to fly to others that we know not of."

ON THE PERIPHERAL ACTION OF THE OPIUM ALKALOIDS — EFFECT ON SENSORY NERVE TERMINALS.

In the *Journal of Pharmacology and Experimental Therapeutics* for August, 1916, MACHT, JOHNSON, and BOLLINGER conclude from an investigation of this subject that:

1. A quantitative study of the pain threshold before and after local application of various opium alkaloids shows that they exert a distinctly measurable action on the sensory nerve terminals, producing a slight analgesic effect.

2. In the order of their efficiency in this respect the opium alkaloids may be arranged as follows: Papaverine, narcotine, morphine, narceine, codeine, and thebaine.

3. A combination of total opium alkaloids was found to be more effective than the amount of morphine, or of papaverine

or narcotine, it contains would be if given alone.

4. The local effect of opium observed in this investigation agrees well with numerous empirical observations by clinical men in the past and present.

TUBERCULOSIS OF THE CERVICAL LYMPHATICS.

In the *Journal of the American Medical Association* of August 12, 1916, Dowd states that it is not the purpose of his paper, based on six hundred and eighty-seven cases, to make exhaustive comparisons between the different forms of treatment which are used for this disease. There are many of them: Roentgen-ray, sea bathing, heliotherapy, tuberculin, Bier's hyperemia, etc. It is rather his purpose to call attention to the natural history of the disease, and to the results of the treatment which he has used. He has, however, visited various institutions in which these measures are used, both in this country and abroad, and has noted at least three elements which should be considered: (1) differences in diagnosis; (2) differences in interpretation of what constitutes an operation; and (3) differences in interpretation of what constitutes a cure.

Clinicians who do not have the opportunity of removing the lymph nodes and having them examined microscopically have come to consider many cases tuberculous which have not been so considered in this study. For example, Hawes says: "In regard to the diagnosis of tuberculous adenitis, Allen believes that 60 per cent of enlarged glands in children are tuberculous; Philip is of the opinion that enlarged cervical glands should be considered tuberculous unless there is definite indication to the contrary. It is my custom to consider these enlarged glands as tuberculous if, on careful examination of the patient and treatment of all possible sources of infection, no other cause can be found."

It is manifest that on this basis many cases are treated as tuberculous which have not been so considered in Dowd's work, just as the older observers considered hip-joint inflammations tuberculous, which we now know to be due to the pyogenic bacteria.

Very early in this study such nodes, when removed, were found to show only hyperplasia; and since Dowd does not advise the removal of hyperplastic nodes, every effort was made to avoid operation on them.

Dr. Farr, who saw many of these cases in the Wilkes Dispensary, states that probably five patients with hyperplastic adenitis apply there for every one with tuberculous adenitis. If a small proportion of them had been diagnosticated tuberculous, they would have had a very exaggerated idea of the curability of the disease.

It is astonishing to note the class of cases which are cited as operative failures. We do not talk about the operative treatment of appendicitis when the appendix is regularly left in position, nor about the operative treatment of cancer, unless every effort is made to remove all the cancerous material, nor do we talk about prostatectomy unless the prostate has been removed. We surely should not talk about the surgical removal of tuberculous neck lymphatics unless there is evidence that thorough operations have been done.

There seems to be only one way of determining the condition of the lymph nodes —that is, to study enough of them after removal to form a fair comparison between the preoperative appearance and the postoperative findings. It is possible that a patient could have a ruddy appearance and yet have masses of tuberculous lymph nodes in the neck. Such patients have been considered cured by careful and honest advocates of some of the methods of treatment here given, but have not been classed as cured in this study.

If, therefore, we make a comparison between operative and non-operative methods of treatment, we must remember that those who see the lymph nodes, and those who do not see them, must of necessity have different conceptions of the conditions with which they are dealing. With this in view,

we must believe that our patients should have the advantage of such forms of treatment as are likely to help them. If operation gives them the best likelihood of cure, they should have operation. If operation plus another form of treatment is desirable, they should have both. If another form of treatment gives a quicker and better cure, it should be used; but a patient should not be allowed to drag from Stage 1 to Stage 2 while indefinite forms of treatment are being tried, nor should he be kept under treatment for months, or even years, with discharging sinuses and disturbed health when a forty-minute operation and ten days' after-treatment would result in cure.

PYORRHEA ALVEOLARIS—ITS COMPLICATIONS AND ITS TREATMENT WITH EMETINE.

KOCH in the *Indianapolis Medical Journal* for September, 1916, states that it should be stated that although emetine hydrochloride is of beneficial effect in the treatment of amebic pyorrhea alveolaris, it alone will not cure the disease. And the same may be said of the local dental treatment, for valuable and essential as it is, it cannot, unaided and unrepeated, produce a lasting cure. A rational management of this disease requires the employment of both measures—the emetine hydrochloride to remove the exciting cause, and proper dental instrumentation is required to remove the predisposing causes and the factors interfering with tissue healing.

TREATMENT OF ALVEOLAR OSTEOMYELITIS (PYORRHEA ALVEOLARIS) WITH VACCINES.

In the *Boston Medical and Surgical Journal* of September 14, 1916, MEDALIA states that he does not go into the details as to the use of instrumentation in this disease, since he has always depended upon the dentist for this phase of the treatment. The principles of instrumentation, however, as far as he can see, which should be kept in mind by every one, are: the removal of local irritation, such as tartar deposits and calculi when present; avoiding ill-fitting crowns and injurious plates; doing away with malocclusion; removing all teeth that cause crowding of other teeth; keeping pockets open so they can readily drain; and, with the aid of the *x*-ray, to determine which of the teeth have lost all their bony support, which teeth should be removed.

It is interesting in this connection to cite Merritt's view that "pyorrhea can be prevented in 90 to 100 per cent," and that it "can be cured by instrumentation, provided only that it is done skilfully." While Talbot says: "In the treatment of pus pockets, the less instrumentation used to remove the deposits upon the roots of the teeth, the better. All that is necessary is to give nature a chance."

Here are the views of two extremists on instrumentation. One thinks he can cure by instrumentation alone practically all cases of alveolar osteomyelitis, throwing down everything else suggested in connection with the treatment of this disease; while the other would not even have us properly remove the deposits on the roots of the teeth. The truth of the matter is that some dentists go much too far with instrumentation, while others do far too little. The happy medium is what is required.

The proper knowledge of the anatomical relation of the root of the tooth to its surrounding tissues, the thorough understanding of the principles underlying instrumentation, together with the proper conceptions of its limitations, will all help one strike the happy medium in this phase of the treatment.

Medalia can say at this present time for emetine treatment that the consensus of opinion is that whatever improvement has been noticed from its use is not so much due to its effect upon the endameba, but rather to its hemostatic action, as well as its bactericidal properties. It is surely not a curative agent of the nature of chemical drugs in general in their effect upon chronic diseases. No sooner is their use stopped than they are immediately eliminated by the system, allowing the infectious agents, of

whatever kind they may be, at once to start the process up again. Bass and Johns, the original advocates of this treatment, have found a considerable number of cases in which the endamebæ have reappeared after they had been absent for various periods of time following the use of emetine, in various ways, and again a considerable number of cases in which the endamebæ have not been eradicated for even a short time by emetine. They have, therefore, been advising recently the continuous use of this drug in patients suffering with this disease. Reports are coming in thick and fast now, both in the medical and in the dental literature, of the failure of emetine in this disease from men who have used emetine in a large number of cases, and have found it of very little help. Even in the most optimistic report on the use of emetine, published by Rudolph C. Lineau, in which he claims that the inflammatory condition in the mouth subsided after the injection of emetine, he, too, believes that the improvement was due to the hemostatic action of the emetine, and not to its specific effect upon the endamebæ.

A very good article on the endamebæ of the mouth was published by Charles F. Craig, who had treated several "pyorrhea" cases with emetine "in the most approved way for several weeks." He has found that whereas the endamebæ generally decreased in number by its administration, they certainly were not eradicated, and that a similar decrease in number was true of the spirochetes. There is just as much ground to consider the spirochetes as the cause of the disease because of their presence before, and their decrease after, the administration of this drug, according to him, as there is to consider the endamebæ to be the "specific" cause of pyorrhea.

It is rather surprising to read in an article in this connection, by Kolmer and Smith, that they have studied the bactericidal action of emetine *in vivo* on staphylococcus aureus, bacillus tetani, and bacillus anthracis, all of which organisms are not at all related to the disease in question (with the rare exception of the staphylococcus aureus, perhaps). Their findings have, in Medalia's opinion, no bearing upon the controversy and will help very little to establish the effect of the emetine upon the bacteria found in the pockets of this disease. They certainly have no ground under the circumstances to say in conclusion: "Improvement or cure of this disease with subcutaneous injections of emetine is to be attributed solely to its amebicidal action," though they concede some coincidental bactericidal influences on the part of the drug when used locally in the pockets.

Medalia does not mean to minimize the amebicidal action of emetine. This has nothing to do with its bactericidal effect and hemostatic action, which alone are sufficient to account for whatever slight improvement in the gum is noticed in this condition under its use. Personally, he has had no occasion to use emetine, since the autogenous vaccines have given him the desired results. However, cases have come to him applying for vaccine treatment upon whom the emetine treatment had already been tried and had failed, and he has had, as it happened, five such cases in one week recently. He found in these cases, in which, possibly, according to the statement of the patient, there had been slight diminution in the visible pus, some improvement in the inflammatory condition and bleeding, yet the loose teeth were still loose, as before, and the pockets still contained pus, bacteria, and, in some instances, quite a few endamebæ, as shown by microscopic examination of slides made from such pockets. Their applying for vaccine treatment is sufficient evidence of the failure of emetine in this disease.

THE RATE OF ABSORPTION OF VARIOUS DIGITALIS PREPARATIONS FROM THE GASTROINTESTINAL TRACT.

In the *Archives of Internal Medicine* of August 15, 1916, HASKELL, MCCANTS, and GARDNER reach these conclusions:

1. The official tincture of digitalis is absorbed more rapidly from the gastrointestinal tract of cats than is the infusion made from the same leaf in the manner described.

2. The three special preparations of

digitalis, namely, digipuratum, digalen, and digipoten, seem to possess no decided advantage over the official tincture. Digalen is absorbed more rapidly, but the variability in strength and the low standard of strength, together with the high cost of this preparation, more than offset this possible advantage.

CARBON MONOXIDE POISONING.

The *Journal of the American Medical Association* of August 19, 1916, contains an article by HENDERSON in which he says that when a man has been overcome by carbon monoxide, and is thereafter brought out of the bad atmosphere into fresh air, the combination of carbon monoxide with the hemoglobin of his blood immediately begins to break up. The higher the percentage of oxygen in the air inhaled, the sooner the carbon monoxide is displaced and the oxygen capacity of the hemoglobin restored. For fifteen or twenty minutes after removal from the poisonous atmosphere (but not for more than half an hour) it is beneficial to administer pure oxygen or air considerably enriched with oxygen by means of a tank, bag, and mask with valves which do not allow rebreathing. Even when only pure air is breathed, the mass action of its oxygen is usually sufficient to displace the greater part of the carbon monoxide in an hour or even less time, so that the oxygen-carrying power of the hemoglobin is restored sufficiently to meet the patient's needs. Practically all of the carbon monoxide is thus eliminated, and the hemoglobin fully restored in three or four hours. This result is facilitated by the rapid breathing, usually from thirty-five to forty times a minute, which such patients, if not too profoundly asphyxiated, usually develop within half an hour after being removed to fresh air.

Very often the victim never recovers consciousness, and dies a day or two later. Many physicians still hold to the belief, now completely disproved, that the prolonged coma is due to retention of the carbon monoxide, and advocate bleeding and infusion of oxygenated saline solution, the transfusion of blood from some healthy person, and other active efforts at restoration. The minimum time within which it is possible to apply such measures is seldom less than two hours after the patient is brought into fresh air. None of them, nor any known procedure, aside from careful nursing and symptomatic treatment, have been conclusively demonstrated in practice to be of benefit, or have any distinct experimental support. Recovery, when it occurs, is not due to such procedures, but occurs more or less in spite of them. There is no reason to expect them to be beneficial, since it is not retention of carbon monoxide, nor any direct action of the gas, but the result of the injury to the brain and other organs due to insufficient oxygen supplied by the blood while the patient was breathing the gas, which is responsible for the prolonged coma and subsequent death or incomplete recovery. There is no known method of restoring tissue to normality after parenchymatous degenerations have once been initiated. Left to itself nature does all, so far as present knowledge goes, that can be done to stop the abnormal processes. The man recovers completely if the asphyxia has not been too intense and prolonged, although in many cases men who have once been "gassed" exhibit a muscular weakness of the heart permanently thereafter. In more severe cases the patients recover only with the loss, partial or complete, of vision, power of speech, or with some other nervous defect.

To a great extent the severity of the immediate and after-effects of inhaling carbon monoxide depends on the following conditions. In a normal man at rest the tissues consume only a little over one-third of the oxygen which the blood brings to them, while during muscular exertion nearly two-thirds are utilized. Accordingly the blood of a man at rest may become nearly one-third saturated with carbon monoxide without his realizing that anything is wrong. His judgment, temper, and behavior, however, are often affected in ways similar to alcoholic intoxication. Such behavior is

often seen in city firemen and in the men of a mine rescue crew after breathing smoke. Similar behavior occurs frequently among transient visitors to the summit of Pike's Peak, and is clearly due to deficiency of oxygen.

If a man in this condition tries to make any considerable exertion, the fraction of his hemoglobin uncombined with carbon monoxide may be insufficient to transport the oxygen needed, and he is liable to collapse. When more than half saturated, he is liable to collapse even at rest. If he remains for a considerable time in this condition, the delicate nerve cells of the brain, and less often also other organs, are injured by the insufficient supply of the oxygen which the blood is able to transport to them, and unconsciousness (coma) results. As a rough estimate, it may be stated that usually a man will die who has breathed 0.2 per cent of carbon monoxide mixed with air which is in other respects normal for four or five hours, or 0.4 per cent for one hour. With from 2 to 5 per cent of carbon monoxide, as after an explosion of coal dust, nearly all of the hemoglobin is combined by the first few breaths drawn, and death follows almost as quickly as in drowning. This is the case also when illuminating gas only slightly diluted with air is inhaled.

The percentage saturation finally reached in breathing any mixture of air and carbon monoxide depends on the relative amounts of the two gases present in the inspired air, multiplied by their relative affinities for hemoglobin. The rate at which the partitioning of the hemoglobin between the two gases proceeds toward the equilibrium point depends largely on the volume of the subject's breathing. A child having a relatively greater respiratory exchange for its size is overcome more quickly than an adult.

On this account small animals, as mice and birds, are overcome much more quickly than are men. Canaries are always carried by the rescue crews of the Bureau of Mines into mines in which there is reason to suspect the presence of carbon monoxide. After the bird has fallen from its perch the portable cage can be closed and oxygen run in from a small tank attached to it. Experience demonstrates that birds may be thus temporarily asphyxiated and revived repeatedly in the course of a few hours, or on many successive days, and be none the worse thereafter. This could scarcely be the case if carbon monoxide had any general poisonous action apart from its temporary combination with hemoglobin. Furthermore, the evidence available indicates that the mere breathing of inert gases deficient in oxygen but containing no poisonous element produces symptoms, degenerations, and subsequent death in all respects like those resulting from carbon monoxide poisoning.

CHLOROFORM IN LABOR.

HILL in the *Journal of the American Medical Association* of August 19, 1916, asserts that many patients, particularly multiparas, do not need an anesthetic at any time during labor. Some require it only at the final expulsion. But there must be no arbitrary rule as to when it should be begun. The time to administer chloroform is not at two hours or at fifteen minutes before the expected end of labor; it is when the patient begins to be unequal to the suffering. Hold the morale of the patient; keep the pain within the limits of her fortitude; have her inspired with her efforts and assured of your assistance if the suffering is too great. She will not be the worse for such consciousness of pain as she has borne easily and willingly. She will not regret amnesia, but will remember with satisfaction her share in the victory. A very little chloroform in the early periods of labor will be sufficient to control the patient and secure her tranquil coöperation. It is a fortunate circumstance that the neurotic women, who are most likely to need early analgesia, are also most amenable to suggestion and on small doses are brought into the semihypnotic state.

It is not within the scope of his paper to make a comparison between chloroform and various other agents. Ether, nitrous oxide alone, nitrous oxide and oxygen, and

scopolamine and morphine, all have adherents. Some of these narcoses have just begun to arouse interest. Others have attained a great popularity which is already subsiding.

Hill's purpose has been to seek reassurance for the many who find chloroform satisfactory. He wishes to emphasize the fact that chloroform in normal childbirth produces a distinct anesthesia in which its effects are strengthened and supplemented by the influence of suggestion.

The use of pituitary extract with chloroform by greatly shortening the labor further restricts the dosage of the anesthetic and modifies the rôle played heretofore by chloroform in labor cases.

The question of remote poisoning is not new, but has been before the profession for more than half a century. Late developments in labor cases in which chloroform was used have necessarily been watched by many competent obstetricians, yet there is practically no incontestable evidence of late poisoning in normal women in labor.

There is no parallel between animal experimentation, on which the late toxic effect of chloroform is alleged, and its use in normal obstetrics.

THE PHARMACOLOGY OF EMETINE.

PELLINI and WALLACE in the *American Journal of the Medical Sciences* for September, 1916, state that from their experience they wish to emphasize the following points:

1. Emetine depresses and may eventually paralyze the heart.

2. It is a powerful gastrointestinal irritant whether given by mouth or subcutaneous injection.

3. It causes a definite derangement of metabolism, characterized by an increase in nitrogen loss and an acidosis.

4. While in normal individuals given moderate doses these actions may not be of importance, in pathological states of the circulation, intestinal tract, or metabolism, they may be a very definite source of danger.

THE DIETETIC MANAGEMENT OF HYPERCHOLESTERINEMIA IN CASES OF CHOLELITHIASIS.

ROTHSCHILD and ROSENTHAL in the *American Journal of the Medical Sciences* for September, 1916, state that they believe first that since the cholesterin content of the blood is dependent upon the cholesterin content of the food, by diminishing the latter they can correspondingly diminish the former; and second, that by rendering the absorption of cholesterin as difficult as possible, the cholesterin content of the blood will also be lowered. These two conditions can be satisfied by placing the patient on a fat-free diet which both excludes lipoids to a large extent and renders difficult the esterization of the free cholesterin of the blood.

Our foods in general are poor in cholesterin esters. Those articles of diet which are rich in lipoids are excluded—eggs, cream, butter, meat, and fish. On a strict practically lipoid-free diet, only vegetables are allowed, excluding beans and peas, which are fairly rich in a metameric product, phylocholesterin. All other vegetables, as well as cereals and sugars, are allowed. The milk should be skimmed and fat-free buttermilk permitted. This diet is so strict that the majority of patients will not maintain it for a long period; therefore these investigators have devised "fast and feast day" periods. For three or four days a week the patient lives on the strict, lipoid-free diet outlined above, the so-called fasting periods, which serve to deplete the organism of the stored-up lipoids. For the next three or four days, dependent upon the grade of the hypercholesterinemia, a more liberal diet is permitted, the so-called "feast days."

On the "feast days" the patient is allowed, in addition to the articles stated above, well-cooked lean meats and fish, excluding salmon, shad, and blue-fish, the fat content of which is high. Oleomargarin is allowed instead of butter. On this regimen they have controlled and reduced the lipoid content of the blood of their series of cases. In one case the hypercholesterinemia, which

was 0.330 per cent (normal 0.160 to 0.180 per cent), was reduced to 0.233 per cent in fourteen days; in another from 0.350 to 0.268 per cent in ten days. In four other cases the cholesterin content of the blood has been maintained at the normal figure since operation, a period of two to eight months.

LATE RESULTS OF SPLENECTOMY IN PERNICIOUS ANEMIA.

KRUMBHAAR in the *Journal of the American Medical Association* of September 2, 1916, reaches these conclusions:

1. Of the 153 patients studied, 19.6 per cent died within six weeks; a distinct improvement in the clinical condition and in the blood picture occurred in 64.7 per cent, and no improvement in 15.7 per cent.

2. The rather high postoperative mortality (practically 20 per cent) may be due to poor choice of cases in the early series. As a much greater proportion of the more recent cases has survived the operation, the true postoperative mortality is probably much less than 20 per cent.

3. Of the individuals who showed improvement shortly after operation, nearly two-thirds of the total number, a large number have failed to maintain this improvement, or have since died in a relapse or from intercurrent disease.

4. Although a few have continued in good condition during the period of observation (over two years), in no case can it be said that a cure has been effected, and the blood of these individuals continues to show many of the characteristic signs of pernicious anemia.

5. On account of the improvement that follows splenectomy, it would appear to be not only a justifiable, but in many cases an advisable, procedure; but in no case should a cure be promised or the operation undertaken except under the most favorable conditions.

6. The best results are obtained if the operation is preceded by one or more transfusions, and those patients who relapse after operation may still be greatly helped by transfusion. Whether or not transfusion would have produced equally good results in the absence of splenectomy is a question that cannot at present be decided.

7. The most favorable results may be expected in individuals who have not passed the fifth decade, in whom the disease has not progressed for more than a year, and who have a relatively good blood picture (that is, an anemia that is not of too extreme a degree or of the steady progressive type). Individuals with enlarged spleens have done better than those in whom the spleen was small or of normal size, as have also those suffering from an anemia characterized by excessive hemolysis.

8. The opposite of these conditions should be considered as unfavorable factors, as should also the existence of spinal cord symptoms or the presence of an aplastic bone-marrow.

GASTRIC FUNCTION IN PULMONARY TUBERCULOSIS.

MOHLER and FUNK in the *American Journal of the Medical Sciences* for September, 1916, tell us from a study of the early and advanced cases of pulmonary tuberculosis under observation they conclude:

1. That pulmonary tuberculosis causes a definite downward progression in both the motility and the secretory function of the stomach from the very beginning of the disease.

2. That hyperacidity with symptoms occurring in early stages and described by previous writers as common is quite rare. That even hyperacidity without symptoms is rare—the type which corresponds to the normal "hypersecretory curve" of Rehfuss existing in 40 to 50 per cent of normal individuals (Rehfuss) exists considerably less frequently in early tuberculous patients. This would indicate that even in early tuberculous patients changes in gastric function are present.

3. That the so-called "pretubercular dyspepsias" of previous writers are misnamed, and that Mohler and Funk believe they are

in reality manifestations associated with definite tuberculous infection.

4. That they do not believe, on the basis of their studies, that there is an "irritative stage," giving hyperacidity in early tuberculosis. Their studies suggest that the gastric disorder is the result of disease of the gastric mucosa.

5. That there is a distinct tendency toward the formation of a definite clinical syndrome known as delayed digestion which becomes more and more associated with symptoms as the disease progresses.

6. They believe with Einhorn that the swallowing of tuberculous sputum plays a highly important rôle in the continuation and aggravation of disordered function. No less important are the visceroptosis and gastrectasis.

7. That the fractional estimation with the development of secretory curves is at present the most accurate method of studying the gastric function.

THE EFFECT OF POTASSIUM IODIDE ON THE LUETIN REACTION.

KOLMER, MATSUNAMI, and BROADWELL in the *Journal of the Ameriean Medical Association* of September 2, 1916, conclude as follows:

1. Well-marked positive luetin reactions were observed among a group of healthy non-syphilitic persons following the administration of potassium iodide.

2. Similar results were observed among non-syphilitic persons suffering with various other diseases.

3. Somewhat severe reactions were observed following the intracutaneous injection of 0.1 Cc. of 0.5-per-cent agar-agar.

4. The strongest reactions were observed when the luetin was injected during or immediately after the ingestion of potassium iodide.

5. Positive luetin reactions were observed among normal non-syphilitic persons as late as one month after the ingestion of large doses of potassium iodide.

6. In some instances the administration of potassium iodide caused the site of a former luetin injection to develop inflammatory phenomena progressive to pustulation.

7. Similar but less marked reactions to luetin and agar were observed among guinea-pigs and rabbits following the oral administration of potassium iodide.

8. Accordingly, a positive luetin skin test has little value in the diagnosis of syphilis among persons who are taking or have recently taken potassium iodide. The amount of iodide capable of producing these reactions varies considerably; also the length of time following the ingestion of iodide when this reaction to luetin may follow. For these reasons physicians should very carefully rule out the possible influence of iodides before conducting the luetin skin test.

TREATMENT OF SYPHILIS.

REASONER in the *Military Surgeon* for September, 1916, writes on this subject and reaches these conclusions:

1. Syphilis should be diagnosed and treatment begun at the earliest possible moment. The dark field—or in the absence of this, staining methods—should be employed as an aid to diagnosis. The organism will not ordinarily be found for several days after the application of antiseptics, especially mercurial salts.

2. The interpretation of the Wassermann reaction is sometimes a matter of difficulty. In the absence of history or manifestations, a single positive reaction is not sufficient evidence upon which to base a diagnosis. In the presence of suspicious manifestations, one or more negative Wassermann reactions is not sufficient evidence upon which to base a diagnosis. Other procedures may be necessary to establish the diagnosis. Even with a uniform technique the reaction of an individual may be subject to unaccountable variations.

3. The greatest good will be accomplished by the administration of both salvarsan and mercury. The best results are to be expected when treatment is begun early. The administration of mercury should be pushed

to the physiological limit. The soluble salts of mercury have some points of superiority over the insoluble salts. Treatment by way of the mouth does not give the best results. The results obtained from inunctions, when properly given, compare favorably with those from any other form of mercurial administration. Potassium iodide is not in itself an antisyphilitic drug. Its greatest field of usefulness is in the presence of tertiary gummatous lesions in conjunction with antisyphilitic drugs. Frequent examinations of the urine are desirable, as both salvarsan and mercury may exert an untoward effect upon the kidneys.

4. It is believed that syphilis is curable in a certain percentage of cases. A tentative standard has been proposed. Further investigation is desirable along these lines.

5. The results obtained from spinal fluid examinations are of great value. These examinations should be more generally practiced than is now customary.

6. The provocative Wassermann reaction is a refinement of the ordinary reaction. Information may be obtained from this reaction which can be secured in no other manner.

7. Rubber gloves are a desirable protection to the operator in handling syphilitics.

8. In positive cases, further information may often be obtained from a titration of the Wassermann reaction.

PAINLESS LABOR.

EDGAR in the *Journal of the American Medical Association* of September 2, 1916, expresses his belief that as an intermittent analgesic or anesthetic, the nitrous oxide-oxygen mixture is well adapted to the second stage. Webster and his associates have done much to make this method of painless labor popular. In the second stage it does not interfere with uterine contractions as does ether and chloroform, but by arresting pain prevents shock and exhaustion, and resistance not being lowered the patient is the better able to stand subsequent infection or complication. His experience had been limited entirely to its use in the second stage, and in all the mass of recent literature on the subject he gathers that it is of no value in the first stage, or else the authors avoid mention of its status in this stage.

In the hands of inexperienced hospital interns results with this method have been deplorable, if not dangerous to the patient. Under the management or supervision of a first-class anesthetist, the method works out most satisfactorily. Edgar has experimented with three gas machines, and has finally settled on a simple single bag instrument.

He dissents from the statement that the administration of nitrous oxide-oxygen is safe in unskilled hands. It is difficult to reconcile the statement of the recent advocates of nitrous oxide-oxygen analgesia and anesthesia, and the teachings of some of our most expert users of this gas combination. On the one hand, we are repeatedly told that the use of nitrous oxide and oxygen for analgesia and anesthesia is a simple matter for one to become proficient in after a few trials.

In other words, in analgesia work, there is danger that the patient coming out from under the influence of the gas may suffer from the effects of shock due to the acuteness of the suffering, or, on the other hand, the danger of anesthesia in the hands of the novice. Some of the best obstetricians are confessedly poor anesthetists.

Nitrous oxide-oxygen analgesia or "obstetric" ether or chloroform for the second stage of labor pushed to anesthesia for the perineal stage, and, possibly, forceps delivery with vapor anesthesia to eliminate part of the second stage, is a satisfactory procedure.

Moreover, nitrous oxide-oxygen analgesia or anesthesia is superior to any other during labor, because of its oxytocic action.

Eventually an established method of painless labor may be considered among public health questions.

Lessening or abolishing the pain of labor may in the future limit birth control and criminal abortion.

Drug addiction after a prolonged drug narcosis in the neuropathic is a possible contingency.

The dangers to the unborn or newly born child are negligible when drug narcosis is limited to the first stage of labor.

DUODENAL ALIMENTATION.

In the *Journal of the Missouri State Medical Association* for September, 1916, LARIMORE states that duodenal intubation has been accomplished in his experience without any elaborate manipulations. He has employed a small thick-walled tube, No. 8, using at different times both the Einhorn gold-plated olive and the larger Rehfuss fenestrated steel olive. He has no preference. When possible he has the patient sitting when the tube is introduced into the pharynx. This position is not necessary. The olive may be introduced into the pharynx by the operator when the patient says "Ah." The patient then swallows once. The olive is grasped by the pharynx and esophagus and is rapidly carried down. Any gagging or retching induced by the tube being in the pharynx is best controlled by rhythmic breathing. The patient should be carefully instructed about the manner of swallowing the tube, otherwise he will endeavor to chew in the tube, and to aid its passage by repeated swallowing. This tends to aggravate the retching. When the tube has reached the cardia, as determined by the 45-centimeter mark, the patient turns on the right side, and the tube is then introduced to the 80-centimeter mark. With this simple manipulation the olive progresses over the lesser curvature and into the pars pylorica, from where it will on favorable peristaltic action be taken into the duodenum. When vomiting has been a distressing symptom, the comfort of the patient is much improved and the passage of the tube facilitated if before attempting to present it at the pylorus the stomach is lavaged by several syringes of water, to which sodium bicarbonate may be added. It has seemed that by inflating the stomach moderately the olive was more readily placed at the pylorus. Inflation secures a separation of the stomach walls, which would not otherwise occur unless by fluid. The separation lessens the liability of the olive lodging in a sulcus and of the tube curling. After the olive has been placed at the pylorus, it is necessary to await its passage into the duodenum. Others have used various manipulations to facilitate this, such as elevating the hips and turning the patient on the back at occasional intervals. Larimore has never found that these availed much. The entrance of the tube into the duodenum is made certain by the aspiration of water-clear, characteristic golden-yellow duodenal contents. Duodenal contents are often regurgitated into the stomach and become turbid when mixed with acid, and the aspiration of such turbid fluid does not indicate with certainty the correct position of the olive. When uncertainty exists, various fluids may be introduced into the stomach, either by mouth alongside the tube, or by the use of a second small tube, introduced only into the stomach. Milk may be used, or water colored by carmine or by methylene blue. If one of these, which has been introduced directly into the stomach, is immediately aspirated from the duodenal tube, it is certain that duodenal intubation has not yet been accomplished. If it is impossible to aspirate these colored fluids after repeated attempts, and instead we secure characteristic duodenal contents, the olive is certainly located in the duodenum. The duodenal tube is then introduced until at least 90 cm. are within the alimentary tract.

It is often a problem to maintain intubation permanently, especially when vomiting and retching is persistent. In Larimore's experience keeping the stomach empty is one of the best means of maintaining the duodenal position of the tube, and he has used a second tube terminating in the stomach for this purpose. This has served not only to keep the stomach empty, but by occasional lavage has reduced the tendency to vomiting, and has a very helpful therapeutic action on any intragastric condition.

When the tube is in its proper place, the patient may rest on the back. However, with any danger of misplacement, Larimore prefers to have the patient lying on the right side as long as that position is comfortable. The left-sided position is distinctly contraindicated.

To very sick and nervous patients the tube is apparently very annoying and discomforting. In these urgent cases he has used morphine or chloral hydrate. Bromides will sometimes be sufficient. The annoyance has seemed to be a result of the patient's general nervousness and sensitiveness, more than a direct effect of the tube. One patient, who complained of much of this annoyance, requested, after she had recovered to the point of taking all food by mouth, to retain the tube for two days, that she might take a preoperative dose of castor oil by that means. Another patient, having much delirium and resenting the use of the tube, endeavored to bite and chew the tube in two. Passing the tube outside the teeth between the alveolar process and the cheek, and allowing it to enter the throat behind the last molar, protected against this. This position was unusually well maintained. Adhesive strips surrounding the tube also protected it from the teeth. This patient would make quick endeavors to withdraw the tube, and once did so. To prevent this a gauze necklace was used, and the tube pinned by means of adhesive strips to this necklace.

Others have used a cocaine solution for the throat and esophagus before attempting intubation with certain hypersensitive patients. Larimore has never found this necessary and has never failed to pass the tube into the stomach without any such aid, although it was frequently necessary to make many attempts.

The location of the olive in the duodenum is a consideration of the greatest importance. Feeding progresses better and the patients are more comfortable apparently when the tube is allowed to progress into the third part of the duodenum or into the jejunum. When held higher in the duodenum patients suffer after feeding from feelings of great distention and nausea. The tube should properly be beyond the pylorus from 20 to 35 cm., or about 125 cm. from the teeth.

The services of a trained nurse are of the utmost value, especially in urgent cases. Most nurses very readily learn the use of the tube and control it quite satisfactorily. Larimore usually gives the nurse a brief set of typed instructions as follows:

The tube is in the duodenum when golden-yellow bile can be persistently aspirated.

If the tube is in place, the patient may be in any position other than lying on the left side. Should the tube be dislocated the patient should lie on the right side, but may occasionally turn on the back for a few minutes.

Retching due to the tube is best controlled by rhythmic breathing.

Feeding is accomplished by

1. Slow injection.

2. Gravity flow. The nutrient fluid is poured into the syringe barrel and allowed to flow into the tube very slowly; the rapidity of the flow is easily regulated by the height of the barrel above the mouth.

3. The drop method, in which a continuous saline drop apparatus is arranged to give the fluid into the tube at from 40 to 60 or more drops per minute.

After a feeding is finished, inject a few cubic centimeters of warm water and then a few cubic centimeters of air, to clean and empty the tube of the nutrient fluids. The tube holds only 5 cubic centimeters.

The feedings progress as follows:

1. Two ounces of whole sweet milk are given each two hours from 6 A.M. to 8 P.M., increasing each feeding by 1 ounce each day.

2. On the third day one egg is added to every third feeding, and on the fifth day to every second feeding, and later to every feeding if so ordered.

Have the fluids at a temperature of 90° to 100° F. when administered.

In case sodium nitrate is ordered, it is used 1 grain to each ounce of milk.

Discontinue feedings should the tube be-

come displaced; that is, if bile cannot be aspirated.

Small quantities of water, cool but not iced, may be allowed by mouth.

Attention should be paid to the stools for the appearance of curds or excessive fermentation.

Other nutrient fluids are prepared according to the formulas which follow. They are arranged to eliminate any one of the usual foods, milk, eggs, and lactose, which may not be well borne.

1. Whole milk, 6 ounces; eggs, two; lactose, 2 ounces.

2. Strong broth of chicken or beef, 6 ounces; eggs, two.

3. Cream of wheat prepared as follows: Four ounces of dry cereal cooked in a double boiler for two hours and until very thick, made thin with whole milk until it can be forced through the tube. One ounce of sugar is added, one-half drachm of salt. Quantity of milk is noted in order to calculate the caloric value.

4. Oatmeal jelly is prepared in a similar way.

5. Whole milk and beaten whole egg are also used.

6. Very frequently, when acidosis is severe, 25 per cent glucose solution is used.

When duodenal feeding is continued for any long period, laxatives should be used as is necessary to clear the bowel and reduce fermentation. These may be given through the tube.

PITUITARY EXTRACT IN OBSTETRICAL PRACTICE.

In *American Medicine* for August, 1916, PERRY reports his experiences with pituitrin. He states that labor pains were induced in from three to five minutes, generally intermittent at first, but became regular in about fifteen minutes. The contraction never exhibited the character of spasmodic pain, and he observed no case of tetanus uteri in his series. There were no symptoms in either mother or child to show any untoward effect of the injected drug.

Delivery of the child is hastened and expulsion of the placenta is accelerated. The uterus firmly contracts, thereby preventing postpartum hemorrhage, clot formation in the uterus, and loss of blood.

An agreeable after-effect of the remedy is its favorable influence on the evacuation of the bladder; hence its value in cases of puerperal ischuria.

The foregoing are all desirable after-effects, together with the apparent more rapid recovery after the hardships of labor, and point to the fact that pituitrin is proving an indispensable remedy in obstetrical practice. It can be given without danger to mother or child, keeping in mind the contraindications of anatomical obstruction in the birth canal, a too narrow pelvis, nephritis with a high blood-pressure, and exophthalmic goitre.

Perry would be inclined to give it late in the second stage in a case whose history would lead him to anticipate secondary hemorrhage.

Lastly, he would advise against the too early use of pituitrin. The cervix should be well dilated and rigidity overcome before its administration; any possible dangers may be thus avoided.

VACCINE TREATMENT OF WHOOPING-COUGH.

BLOOM in the *New Orleans Medical and Surgical Journal* for September, 1916, concludes that:

1. The treatment of pertussis by vaccine therapy is most efficient providing the procedure in following it is correct.

2. Give large initial dose, not less than 120,000,000; increase 60,000,000 for each succeeding dose, and give maximum quantity every other day until one of the marked symptoms shows an appreciable improvement. Continue every three to four days until cured.

3. Vaccine is preferable because:

(*a*) No reaction.

(*b*) Duration averages only 28 days.

(*c*) The loss of weight is minimum—14 ounces.

(*d*) The intensity and number of cough-

ing spells become less after three injections have been given.

(*e*) Vomiting ceases after six injections.

(*f*) Sleep is not disturbed after 5 to 12 days.

(*g*) No complications in 13 cases after 8 to 12 months' duration.

FUMIGATION BY CYANIDE GAS.

In the *Military Surgeon* for September, 1916, CREEL of the U. S. P. H. Service contributes an article on this topic which is of much value. He presents a table of the strength of cyanide gas and duration of exposures necessary for the destruction of rats and various insects. In these proportions and for the indicated duration of exposure the gas has been proven to be invariably lethal, even under conditions affording unusual protection, such as intervening bulk of cargo (experimentally) or numerous layers of closely woven cheesecloth.

PROPORTION OF CYANIDE GAS LETHAL FOR ANIMALS AND INSECTS.

Objects exposed to gas.	Duration of exposure.	Strength of gas.	Cost of fumigation per 1000 cu. ft. of air space.
Rats.....	1 hour....	5 oz. KCN per 1000 cu. ft. of air space.	$0.08
Fleas.....	15 minutes	2.5 oz. KCN per 1000 cu. ft. of air space.	$0.04
Lice.....	2 hours...	10 oz. KCN per 1000 cu. ft. of air space.	$0.16
Bedbugs....	1 hour....	5 oz. KCN per 1000 cu. ft. of air space.	$0.08
Roaches....	1 hour....	10 oz. KCN per 1000 cu. ft. of air space.	$0.16
Mosquitoes..	15 minutes	0.4 oz. KCN per 1000 cu. ft. of air space.	$0.006 (Approximately ½ cent.)

For the purpose of fumigating large spaces, such as holds of vessels or warehouses, they use as containers stout wooden barrels, such as are used for oil, and for other spaces, as small buildings, or compartments, as storerooms, staterooms, and ship's saloon, they use vitrified jars. The water and acid are first mixed in the container, and then at the last moment before closing the one remaining opening the cyanide is deposited in the water-acid mixture.

In the fumigation of ships in New Orleans, they generally pulverize the cyanide just before the fumigation and place it in an ordinary pillow-slip. This is then lowered through the hatchway into the barrel by means of a strong cord or rope. In buildings on land the operator can drop the bag of cyanide into the barrel or jar without jeopardy, provided ordinary haste is made in leaving.

All openings of the space to be fumigated should be thoroughly sealed before placing the cyanide in the acid-water solution, excepting the one opening for lowering the cyanide into the barrel when ship holds are treated, or the door or window for escape of the operator when buildings are fumigated.

The instructions from the Surgeon-General for the guidance of officers in charge of this kind of fumigation are comprehensive and are quoted herewith:

"When performing cyanide fumigation of compartments, officers will be guided by the following minimum requirements:

"1. On account of the great danger to human life from hydrocyanic acid gas, specific arrangements should be made for the disposition of the crew during the fumigation process, especially if one or two compartments of a vessel are to be treated. A written statement must be obtained from the captain or first officer of the vessel that the latter is ready for fumigation, and that every member of the crew has been accounted for, as not being in the vessel or else not exposed to the fumes of the gas. Persons in one compartment have been killed by fumes escaping from another compartment undergoing fumigation.

"2. Not less than 5 ounces of potassium cyanide or 3¾ ounces of sodium cyanide shall be used to each 1000 cubic feet of space, inclusive of that occupied by cargo.

"3. To each ounce of potassium cyanide 1 fluidounce of commercial sulphuric acid 66B and 2½ fluidounces of water shall be used.

"4. To each ounce of sodium cyanide 1½

fluidounces of commercial sulphuric acid 66B and 2 fluidounces of water shall be used.

"5. All ingredients shall be weighed and mixed immediately prior to each fumigation.

"6. All parts of the vessel shall be placed under fumigation simultaneously, except such compartments as may not require fumigation, in the opinion of a representative of the United States Public Health Service.

"7. All compartments placed under fumigation shall be kept closed for not less than one hour.

"8. The hatches of 'tween decks and the doors of subcompartments are to be opened prior to fumigation, and the barrel or other generator is to be placed so as to secure the most rapid and efficient diffusion of the gas.

"9. All work is to be done under the supervision and to the satisfaction of the medical officer in charge, United States Public Health Service, or his representative."

While their work has chiefly been in shipping, cyanide gas will probably be found to be equally advantageous in the treatment of buildings infected with yellow fever, typhus, or plague where the destruction of infected insects may be necessary.

It is worthy of special note that mosquitoes are exceptionally susceptible to cyanide gas and lice are extraordinarily resistant.

EARLY MORNING TOXIC VOMITING IN CHILDREN.

In the *Archives of Pediatrics* for September, 1916, SOUTHWORTH states that when the chemistry of the intestinal tract goes wrong, either slowly and cumulatively, as doubtless usually obtains in recurrent vomiting, or more abruptly, with the fermentative or putrefactive processes set up by the aid of bacterial agencies, absorption of some of the products into the circulation is certain. Of the degree of the natural power of the organism to cope with these, either by metabolic or excretory means, we know but little.

Fermentative processes, owing to the irritation caused, are more prone than putrefactive processes to set up a conservative diarrhea in an effort at elimination. With free drainage of the intestinal tract, there is, without doubt, excretion through the mucosa of the intestine which serves to some extent to offset the absorption. But with actual or relative constipation, and consequently lowered elimination, the positive balance of absorption gains the upper hand. The effects of milder degrees are familiar in the dulness, depression of spirits, headache, lack of appetite, coated tongue, and even some feeling of nausea, in both adults and children. If not too habitual, this syndrome is promptly relieved by free catharsis, which not only prevents further absorption but opens the channels for active excretory elimination.

The toxemia of recurrent vomiting is probably of gradual and cumulative evolution, coming to a head with the development of marked or relative constipation, or precipitated by some unusual factor—fatigue, nervous strain, the onset of one of the infectious diseases, or the taking of an anesthetic. Here elimination is slow and vomiting prolonged. Fever is not a constant symptom.

With a more active fulminating toxic absorption, such as we may assume occurs with an acute putrefactive process in the intestine, fever is a usual accompaniment, often rising sharply, and if a conservative diarrhea be not quickly established the gastric mucosa participates in the effort at elimination.

It has been Southworth's observation that when a child vomits during the night the vomitus almost invariably contains large quantities of partially digested food; while the early morning vomiting, to which he calls attention, consists only of fluid and mucus, provided the first feeding has not been given. It seems hardly probable that gastric stasis, which so often accompanies acute indigestion or the onset of febrile

conditions, could be overcome in the final hours of the night, and the stomach be completely emptied of all vestiges of food before the early morning vomiting occurred.

It is much more plausible to assume that in the early morning type the disturbance of digestion has been primarily intestinal, not gastric; that there is an attempted elimination of absorbed toxic principles by the gastric mucosa; and that these accumulate in the stomach during the hours of sleep when all reflex sensations are more or less deadened by slumber, only to assert their presence on awakening, in nausea and vomiting.

Reaccumulation in the stomach of sufficient quantities to cause a recurrence of such vomiting is comparatively rare during the waking hours. At all events, after the stomach has been emptied by one or two acts of emesis at short intervals, the vomiting has not the persistent character of the true recurrent type. This may readily be due to the difference in the nature of the toxic products in the two conditions, their quantity in the circulation, or their rate of excretion.

If vomiting does not occur before food is taken, it may occur when the first food is given, especially if that feeding be milk. So common is it for children to vomit in the morning, if they vomit at all during the course of minor illnesses, and not toward night—as might readily be expected, if due to overtaxing of the stomach—and so frequently will milk, if given at the first feeding, be ejected in large masses, that it has come to be Southworth's habit, where in the presence of fever he suspects toxemia, to order for the first morning feeding broth or broth and barley gruel. By thus avoiding the formation of acid coagula, he feels that he has often averted the tendency. Dilution of the stomach contents, or the demulcent action of the barley, when added, may play some part in this result.

A further characteristic of both toxic types of vomiting, as distinguished from that of acute indigestion, is the quicker recovery of the digestive functions of the stomach. In the toxic types, the stomach functions are only slightly impaired, and as soon as elimination has been accomplished by free catharsis, and vomiting has ceased, simple food will be received and digested. Appetite, which is the best single indication of digestive capacity, also returns more promptly.

The extreme caution so often displayed in resuming feeding after an attack of recurrent vomiting, and the consequent unfortunate condition of under-nutrition so often observed in those whose attacks recur at comparatively short intervals, are both entirely unnecessary. These children should be fed simply, as soon as vomiting ceases; and when appetite returns, diet of a simple character should be abundant. The sole obstacle to such prompt feeding in the acute toxic type is the state of the intestinal digestion, which, differing from the recurrent type, has been acutely disturbed. But with proper elimination and suitable remedies the resumption of ample though simple diet may often be prompt and certainly need not be long delayed, save where diarrhea or a colitis invites caution during the summer months.

Southworth is not aware that the occurrence of vomiting in the early morning has received any special attention, and presents his observations with a view to inviting discussion.

PYORRHEA ALVEOLARIS.

RODDY, FUNK, and KRAMER in the *New York Medical Journal* of September 2, 1916, reach these conclusions:

1. Pyorrhea alveolaris is not a specific disease; its chief etiological factors are: (1) An excessive bacterial flora of the mouth; (2) deviations from normal of the affected tissues brought about by certain diseases.

2. Oral sepsis is the first stage of pyorrhea; the etiology of both is the same.

3. Pyorrhea can be prevented by regular cleansing of the mouth and teeth.

4. The detection of all etiological factors in the majority of cases of pyorrhea requires a thorough dental and medical

examination. Whenever possible an *x*-ray examination should be made.

5. Acute recurrent gingivitis or chronic gingivitis or a persistent excessive bacterial flora of the mouth is a clinical sign of this disease.

6. Systemic complications are rare in the early stages and frequent in the late stages.

7. Coincident systemic diseases are frequently associated with pyorrhea.

8. There is no specific method of treatment.

9. The three indispensable factors in the treatment are: (1) Training the patient regularly to cleanse the mouth and teeth; (2) the institution of whatever dental treatment may be indicated; (3) medical treatment of coexisting systemic disturbances or disease.

10. Emetine may well be employed as an adjunct on the principle that it will do no harm and may possibly in some cases be beneficial.

11. When infectious systemic complications exist, an autogenous vaccine is indicated and even in uncomplicated cases will at times accelerate improvement.

PRIMARY TREATMENT OF WOUNDS IN CIVIL PRACTICE.

PORTER (*Surgery, Gynecology, and Obstetrics,* August, 1916) basing his paper on an experience in the treatment of accidental wounds, chiefly railroad and shop injuries, advises against the use of strong antiseptic lotions and vigorous attempts at mechanical cleansing of wounds. Embedded foreign bodies are let alone. In case of amputation attended by shock a sufficient amount of normal salt solution is injected into the open mouth of the vein in the stump. Amputation is never postponed until symptoms of shock subside. Sutures at best are a necessary evil, and in contused and lacerated wounds peculiarly evil and seldom necessary. Moreover, in this class of wounds the temptation to secure perfect adjustment and apposition by means of needles, nails, wires, etc., should in the main be resisted. Dry dressing is the one preferred as a rule. Narrow strips of protective should be employed to prevent sticking of the dressing and the consequent disturbance of the granulations when the dressing is changed. A non-odorous, non-irritating antiseptic powder used freely in lacerated wounds is advantageous.

Having seen many cases of railroad and shop injury and no instance of tetanus, prophylactic injections are not indicated in this class. Wounds received in barn-lots and on the streets should, however, receive the injection.

FUNCTIONAL STATUS OF AMPUTATION STUMPS IN WAR.

TUFFIER (*Surgery, Gynecology, and Obstetrics,* August, 1916) has gained his information from 13 reports and his own experience, comprising in all over 2000 documents.

He reports over one thousand thigh amputations; over 500 leg amputations; over 500 arm amputations; 251 forearm amputations; 125 disarticulations of the shoulder-joint; and 58 disarticulations of the hip-joint. A considerable percentage had to be operated two or more times, from which Tuffier concludes that after amputation a mutilated soldier has 30 out of 100 chances of having to submit to a new operation.

Estor records over 90 per cent of good upper extremity stumps and 68 per cent of good thigh stumps; 53 per cent of good leg stumps. The reamputations mostly involve the lower extremity. The secondary operations are usually called for because of the wide practice of the classical circular incision. Lesions that render an amputation stump unfit for an artificial limb are, in order of frequency: incomplete cicatrization by ulceration or fistula; pains spontaneous or provoked by the apparatus pressure; often the entities combined. Ulcerations are often caused by too short a flap or by a diseased bone or nerves. Very scant flaps are sometimes cut. Another cause of ulceration is the lack of postoperative care. All urgent amputations are, as a rule, infected. From which it occurs that

periosteal denudation should be carefully avoided as it is unnecessary and dangerous. Caries and necrosis are common reasons for reamputation.

Practical conclusions for each variety of amputation are:

A hip amputation should be made as low as possible, the length of the arm of leverage being of prime importance, especially in the upper third of the femur. A stump of 10 cm. is the minimum required to give a good field for applying the new prosthetic apparatus, a femoral lever that should be efficacious. To obtain a good product it is necessary to have a femur 14 to 15 cm. long.

A sub- or intratrochanteric amputation, or the upper fourth of the femur, is harder to fit with an apparatus than a hip dislocation and gives the same functional results —the amputated walk on the pelvis. It should not be abandoned, for it is less dangerous than a coxofemoral dislocation. To diminish the inconvenience the femur should be straightened as much as possible during the healing of the wound.

Amputations by the circular method give terminal cicatrices which have all the defects of seat, form, and adherence; the technique requires further perfecting.

An anterior flap or a combination of two flaps is the procedure of choice.

Leg amputations immediately below the articulation (an excellent operation) give good general results. Leg amputations should give a cicatrix that will allow for a point of support on the stump directly or on the tibial notches, and should be performed as low as possible. The experiences in the present war show that an external flap gives acceptable cicatrices, while the circular method furnishes results generably deplorable; a number of such stumps cannot be fitted with artificial limbs, and they require one or two reamputations. The present operative procedure should be modified at the seat as well as in the cutting of the flaps.

The posterior flap is preferable, and although it may leave a stump a little too large it can be reduced by compression. The author thinks that bones are badly cut in leg amputations. He possesses dozens of radiographs showing the fibula sectioned much too low, far under the tibia. He recommends high sectioning of the fibula. When the amputation is to be done near the knee, less than 8 cm. from the joint, it would be better to cut the bones higher than lower. The very high cutting, even in the tuberosity of the tibia, gives excellent results, and the author recommends its use. In all these amputations it is advisable to provide for the perfect mobility of the knee, and to direct the cicatrization of the soft parts by elastic molds or by traction.

Tibiotarsal disarticulation, with the cutting of the malleoli as well as the intramalleolar amputation, gives good results. Subastragalus disarticulation, the osteoplastic amputation of the calcaneus, and the Syme operation are recommended. With these operations the fitting with artificial appliances is easy and the stump is tolerant.

THE SPINAL FLUID SYNDROMES OF NONNE AND FROIN AND THEIR DIAGNOSTIC SIGNIFICANCE.

HANES (*Amrican Journal of the Medical Sciences,* July, 1916) concludes that compression of the spinal cord and its meninges from whatsoever cause leads to the formation of a cul-de-sac, more or less complete, distal to the site of compression.

The earliest characteristic change has been described by Nonne as an increase of proteid (Phase I positive) without cell increase (pleocytosis).

As the condition of cord compression persists, the fluid gradually becomes yellow in color (xanthochromia), the proteid content increases enormously, and the fluid, when removed, coagulates spontaneously (Froin's syndrome). Pleocytosis may or may not be present, depending upon whether or not the meninges are inflamed by the pathological process causing the compression.

Xanthochromia of the spinal fluid must

be distinguished from staining of the fluid by hemoglobin derivatives (erythrochromia).

The spinal fluid syndrome of Nonne-Froin is very helpful and reliable in the diagnosis of spinal-cord lesions. When present it always indicates a compressive lesion of the cord.

THE TREATMENT OF CENTRAL NERVOUS SYSTEM SYPHILIS.

WALKER (*Boston Medical and Surgical Journal,* 1916, clxxiv, 195) summarizes the treatment and results in the first 40 cases of central nervous system syphilis at the Peter Bent Brigham Hospital. This group includes cases of tabes, general paresis, cerebrospinal syphilis, and syphilitic meningitis; cases of purely cerebral syphilis are excluded. In the treatment of parasyphilis three methods were employed: one, salvarsan, intravenously alone; another, the Swift-Ellis method; and a third, salvarsanized serum alone intraspinally. Walker used large doses of salvarsan intravenously for those cases treated with salvarsan alone; in those treated with serum intraspinally 20 to 25 Cc. of undiluted serum were used. It was found that cases of syphilis of the central nervous system with only a positive blood react well to salvarsan; those with a positive blood and spinal fluid may react well to salvarsan alone, but they do much better when intraspinal serum is used in conjunction with salvarsan, and some who do not react to salvarsan alone do react well to the combined method. One may obtain improvement in general paresis with the combined treatment. Cases of syphilitic meningitis may clear up with salvarsan alone, but the combined treatment is the quickest. Cases of central nervous system syphilis with a negative blood and positive spinal fluid findings react readily to salvarsanized serum intraspinally alone, even when salvarsan intravenously has failed. The spinal fluid of the cases treated with salvarsan has become negative in two cases, whereas the spinal fluid of seven cases treated with the serum alone has become negative. The author feels that salvarsanized serum is a great asset in the treatment of syphilis of the central nervous system, and in the general run of cases he thinks the Swift-Ellis method is of great value, and that this method in conjunction with mercury given intramuscularly is the best treatment of syphilis of the central nervous system at the present time. Marked improvement always follows such treatment.

In a series of 40 cases HUNT (*Journal of the American Medical Association,* 1916, lxvi, 404) reports a series of 45 cases, of which 40 were given a series of injections of mercuric chloride, and five others sublimin intraspinal injections. Mercury was given at the same time intramuscularly. These cases were paretic, hemiplegic, and cerebrospinal. Three died, which was not due to the treatment. The injections were apparently harmless and seemed to be distinctly helpful in cases of tabes, general paresis, and cerebrospinal syphilis. At intervals of two weeks another reaction was characterized by first an increment of cell count and then a diminution. Then the Wassermann became weak or disappeared. Indeed, the reaction was quite similar to that following salvarsan used in a similar fashion.

PYELITIS OF PREGNANCY.

DANFORTH (*Surgery, Gynecology, and Obstetrics,* June, 1916) observes that the frequency with which infection of the pelvis of the kidney and even of the kidney parenchyma occurs, and the danger which it often brings with it, are not yet generally appreciated. Undoubtedly many cases are entirely unrecognized, and every one who has had much obstetrical experience is aware of instances in which it has been confused with appendicitis, or has seen cases of rise of temperature in the puerperium which have been looked upon as puerperal fever, but which in reality have been infections of the kidney. Careful examination of the urine, coupled with painstaking physical examination, will almost invariably make it possible to differentiate infections of the kidney from either of these. The infection is, with rare excep-

tions, right-sided. This is explained by the fact that the right ureter is pressed upon at the brim of the pelvis by the pregnant uterus, which often inclines to the right. The uterus, as it rises out of the pelvis, passes before the mesentery and is deflected toward the right side. The same factor also, in a measure, protects the left ureter from pressure.

Crew reports a case in which abdominal pain, vomiting, fever, rapid pulse, and chills were present, but in which no pus appeared in the urine until abortion followed an exploratory laparotomy. The appearance of pus permitted a diagnosis of pyelitis to be made, this condition for some reason not having occurred to the examiner earlier. The ureter in this case evidently was obstructed by the uterus, the obstruction, which had not been recognized, being removed when the uterus was emptied.

All observers in this field agree that the bacillus coli is the almost invariable infecting organism. Other organisms, such as the streptococcus, staphylococcus, gonococcus, and even the tubercle bacillus have in infrequent cases been observed.

Much has been written upon the treatment of the pyelitis of pregnancy. Many cases will respond sufficiently to palliative treatment alone. Postural treatment is of great value. If the patient be kept upon the left side or upon the abdomen the uterus will gravitate away from the right ureter, thereby allowing the kidney to drain. With this may be combined water in large amounts, and hexamethylenamine in amounts sufficient to give a reaction for formaldehyde in the urine. If relief is not had within a short time, further means of combating the infection must be thought of.

Vaccines have proved to be disappointing. Certainly while obstruction exists no great result can logically be hoped for from their use. His experience with them has been limited and confined exclusively to the use of autogenous vaccines given after delivery or after the uterus has been emptied. As in such cases recovery usually follows spontaneously, it cannot be assumed that the vaccines were wholly or even in large part responsible for cure.

The ureter catheter is a valuable aid. Text-books, as a rule, merely mention it. But a large number of European writers recommend it as of great value. By ureteral catheterization, a distended kidney pelvis may be drained and pain thereby greatly relieved. And in severe and stubborn cases the kidney pelvis may be irrigated and solutions of silver nitrate or other antiseptics instilled. This procedure may, if necessary, be repeated a number of times. Cystoscopy is, as a rule, not difficult in a pregnant woman, especially in the first half of pregnancy. It should, however, be carried out with great caution, the instrument being introduced with the greatest possible gentleness, as cases of abortion after it are not unknown. The Kelly instrument cannot be used, as in pregnancy the knee-chest position is impossible on account of the large uterus falling forward upon the bladder. With a water instrument carefully used it may be successfully carried out. In cases in which, for any reason, the diagnosis is in doubt, this procedure will clearly demonstrate whether the kidney is at fault, and at the same time offers a means for at least temporary relief. It should not be used until postural treatment and the use of urinary antiseptics have failed.

If the infection advances to such a degree that the integrity of the renal parenchyma is believed to be in danger, more radical means must be considered. The induction of labor must in infrequent cases be resorted to. In the endeavor to escape this radical and unwelcome operation, a number of authors have tried and recommend nephrotomy.

In cases of severe infection in which the kidney has undergone irreparable damage, nephrectomy may be carried out during pregnancy. Cova reports twenty-three cases in which this operation was done during pregnancy successfully. In thirteen of these cases subsequent pregnancies occurred. It seems scarcely possible that such a procedure should be necessary or justifiable in

a case which had been under competent observation from the start. In cases which are first seen after the development of a severe pyelonephritis, it is conceivable that nephrectomy might be a necessary and justifiable procedure. The writer's own view is that cases in which the kidney seems likely to undergo damage sufficient in degree to render later nephrectomy necessary would present a reasonable indication for the induction of labor. One should consider carefully before allowing the infection to proceed, in a case which is seen early, to a point at which sacrifice of the kidney would be necessary.

Nephrotomy may be much more lightly undertaken, for here the kidney is preserved, with a high degree of likelihood of its later resuming full functional activity. Barth believes that nephrotomy is preferable to induction of labor, and there is at least some justification for his view. But the extreme view of Stoeckel, that induction of labor is never necessary, can scarcely be supported, and is not concurred in by the majority of writers.

By far the most important thing in the treatment of this infection is its early recognition; and this depends upon careful observation and urinalysis on the part of the physician. If pyelitis be early recognized and the treatment be instituted immediately, a great majority of cases may be successfully carried through.

HERNIAS OF THE URINARY BLADDER.

Under this caption HEINECK (*Cleveland Medical Journal,* June, 1916) records a careful clinical study of a subject of interest to every operating surgeon, in that he has surely encountered it in his past experience and will do so again, and has at least in one instance if not more failed to recognize it in time to avoid an injury to the bladder, repairing it before closing the parietal wound. It is true that many cases have been published; equally true that many more, and some with fatal termination, have not found their way into literature.

Heineck states that the urinary bladder in its entirety or in part is present in one per cent of all hernias. He has collected all the cases reported in English, French, and German literature from 1886 to 1914 inclusive, and supplemented these by some unpublished personal cases, making a sum total of 164 of vesical hernias in 159 patients. Vaginal bladder hernias are not included in this study; the hernias were external hernias—that is, their outermost overlying saccular covering was skin; each after reaching a certain stage of development gave rise to a more or less visible and palpable, external swelling in the obturator, femoral, inguinal, or other region, depending upon the anatomical location of the hernia.

It is noted that the hernias are extremely rare in infancy, childhood, or adolescence. They are most frequent after the fortieth year of life. Bladder hernia represents an infirmity of advanced life, commonest in males, usually unilateral, with a predilection for the right side. It is somewhat surprising in these cases that the oblique vesical hernias were more common than the direct. Most surgeons would have unhesitatingly said the contrary. It is also noteworthy that vesical hernias frequently appear in the femoral region in women. According to the relation the bladder protrusion bears to the perineum, hernias of the urinary bladder are classified into the following three varieties: Intraperitoneal, in which there is a complete hernial sac; paraperitoneal, in which the herniated bladder process is covered by peritoneum on one surface; extraperitoneal, in which the herniated portion of the bladder is neither engaged in nor contiguous to a hernial sac. The extraperitoneal bladder protrusion is in relation with the subcutaneous tissues and is always distinct from and to the inner side of the hernial sac, if one be present.

There were only four cases reported of intraperitoneal hernias, 53 of paraperitoneal, and 58 of extraperitoneal. Other cases were not reported with sufficient detail to allow of a classification. The herniated

bladder may be reducible, irreducible, obstructed, strained, or strangulated.

As to the etiology, it is much the etiology of hernia in general, together with such conditions as cause prolonged overdistention of the bladder, which are associated with congenital malformation of this viscus. The condition is usually an acquired one, usually not painful, and varying in size in accordance with the distention of the bladder. If a sac be present the bladder is always to its inner and to its median side, or at times below. The bladder may be adherent to the hernial sac, or may be adherent to the spermatic cord.

The latter is sometimes found spread out over a vesical hernia, at times distant from it. At times the diagnosis is not made for a day or so after operation. Indeed, the author states that even eminent clinicians have failed to recognize the true state of affairs previous to autopsy. A desire to urinate caused by pressure upon the hernial swelling and fluctuation in the swelling are preoperative signs usually suggestive of vesical hernias; an unusual amount of fat in the neighborhood of a hernial swelling; difficulty in finding or in isolating the true hernial sac from the tumor mass; the trabeculated appearance of the bladder muscularis; large-sized external hernial opening; and the fact that hernias of the bladder are usually nearer the median line than true hernial sacs.

The occurrence of a second hernial sac is so rare that it is a safe rule to regard as the urinary bladder, until proved otherwise, any structure resembling a second hernial sac.

The pedicle of a herniated bladder process leads down behind the pubic bone into the true pelvis; the pedicle of a true hernial sac leads to the general peritoneal cavity.

Passage of a sound into a cystocele, cystoscopic confirmation of its existence, escape of urine following wounding of bladder. These two latter are convincing signs. Several hours after operation injury to the bladder is suggested by voluntary voiding or withdrawal by catheter of blood-stained urine; or by urine escaping from the hernial operative wound; or by sepsis due to urinary extravasation and peritonitis due to escape of urine into the peritoneal cavity.

As to treatment, the operator should be especially on his guard in operating for recurring hernias. If isolation of the hernial sac from the inner lower portion of the ring be difficult, involvement of the bladder is to be suspected.

The more exact the stripping of the sac, quite up to the deep epigastric artery, the more likely will cystocele, especially in the earlier stages, be discovered.

Vesical hernia is produced by traction on the sac, and efforts to place the ligature high up may result in catching in its bight the bladder-wall.

Of the cases recorded the bladder was accidentally injured in 68. In 31 urine escaped into the operative field at the time of operation. Suture and drainage safely and efficiently remedy the wound of the bladder even though it be accidentally made. The sutures are so introduced as to include everything but the mucosa, and absorbable material must be used. As a routine measure resection of the herniated bladder is not to be recommended. It should be freed and returned to the abdominal cavity. All operators are not agreed as to the time that this permanent catheter should be left in the bladder.

Drainage extending to the bladder wound is a prudent provision against leakage from the sutured viscus. As to results, the author states that the operations for the radical cure of vesical hernias have practically no mortality; nor are they followed by disagreeable sequelæ. Thirteen cases of urinary fistula complicated convalescence. These fistulæ usually close spontaneously.

A careful study of the cases in which death occurred shows that operations for the radical cure of vesical hernias have no mortality *per se*, if all bladder injuries be suitably repaired. Bladder hernias are recognized either previous to or at the time of operation, before closure of the abdominal wound; recovery is rapid and uneventful.

FRACTURES ABOUT THE WRIST IN CHILDHOOD AND ADOLESCENCE.

BURNHAM (*Annals of Surgery,* September, 1916) from a study of fractures about the wrist in adolescence and childhood concludes that typical Colles's fracture is very uncommon before early adult life. In childhood (that is, before the tenth or twelfth year) the common type of fracture about the wrist is fractures of both radius and ulna, either greenstick or complete.

Separation of the lower radial epiphysis is of frequent occurrence during the early part of the second decade and should be carefully differentiated from dislocation of the wrist, which is so rare as to be a surgical curiosity.

When fracture of the radius is suspected, either in childhood or adolescence, the line of fracture should be searched for at a point considerably higher than is the case when the same injury occurs later in life.

In the care of fracture of the lower end of the radius in early life the frequency of the associated fracture of the ulna must be constantly borne in mind, the treatment of the condition being modified accordingly.

RECENT PROGRESS IN THE OPERATIVE TREATMENT OF EMPYEMA OF THE THORAX.

LILIENTHAL and WARE (*New York State Journal of Medicine,* July, 1916) plan their therapy first for the relief of intrathoracic pressure which immediately threatens life, and second, the establishment of a state which should make possible a complete recovery with a minimum of complications and without deformity.

After two years of work and observation they believe they may report progress. Their mortality rate is lower than that of the previous ten years in the same institution, and they have succeeded in preventing the necessity for a single thoracoplastic operation. Moreover, they think they have shortened the period of convalescence of this particular hospital patient by nearly one-third.

Practically all of the patients are examined by means of the Roentgen plate or screen, and this has been of incalculable value in selecting the type of operation. In encapsulated cases and also in the more chronic empyemas the affected side usually shows contraction of the chest instead of distention, the ribs being closer together than on the healthy side. This appearance has often been accompanied by the presence of tough peripleuritic confining membranes, so that at operation the lung did not expand and required mobilization by the division or removal of the exudate.

By the *x*-ray the most favorable point for draining an encapsulated collection has been determined. Two distinct sacs have been found containing pus of different appearance and consistency, one of which would have been overlooked without the *x*-ray. Secondary collections of pus have been demonstrated after the first operation, and the surgeons have been able to empty these secondary sacs promptly because of the accuracy of their localization. During convalescence the degree of pneumothorax can be made out and its gradual disappearance observed. The presence of areas of consolidation can sometimes be observed in cases in which there is doubt between residual empyemata and pneumonia. In one case pneumonia and pneumothorax were demonstrated after puncture outside the hospital had yielded a few drops of pus, the patient being admitted for the treatment of empyema. There was no empyema and the patient recovered without thoracotomy.

The final proof by the aspirating needle should not be made until the patient is on the operating table or within a few hours of operation. Ether should be avoided; local, regional, or nerve-blocking anesthesia, or nitrous oxide and oxygen narcosis, are indicated.

The term minor thoracotomy, indicated when there is need for the immediate relief of pressure, is thus performed: Under local anesthesia a small incision is made, preferably in the seventh or eighth interspace, in the posterior axillary line and carried through the pleura. The ribs are separated by spreading the blades of a

dressing forceps or a pair of scissors, and a small tube is slipped into the chest; or, after the short skin incision, a trocar and cannula is made to enter the pleura, and a drainage-tube is pushed through the cannula, which is then withdrawn, leaving the tube in place. There are various devices to prevent pneumothorax. The simplest is a permanent siphon to keep the tube full of fluid, and so arranged that the level of the liquid in the water supply bottle is lower than the patient's chest, while the tube leading from the chest has its end submerged in weak antiseptic fluid in a vessel on the floor.

In favorable cases this operation is all that will be necessary. The lung expands, the discharge lessens, and recovery follows.

When these minor thoracotomy patients were improved, but showed no sign of progressive healing, they were deemed suitable subjects for major thoracotomy. This operation, however, was performed at the first sitting whenever the case did not look absolutely desperate.

The steps of the major operation are as follows: Skin and muscle incision in the seventh or eighth interspace. Line of incision from the angle of the ribs to the anterior axillary line, more or less, and close to the upper border of the lower rib, to avoid nerves and vessels. Pleura entered carefully to avoid possibly adherent lung. Rib retractor inserted and the ribs separated from four to six inches or more. If still greater room is needed a rib or two above or below the wound at the posterior angle may be cut.

Exploration. Removal, by suction or sponging, of all pus and coagula, then inspection and palpation of lung and pleura.

Adhesions to the chest walls should not be disturbed unless they separate easily.

If the lung expands and fills the chest when the patient strains, and if no sign of lung abscess or fistula is present, the soft parts of the wound may be approximated with chromicized gut and the skin partly closed by suture. Because of the division of the intercostal muscles the ribs will not at once fall together. There will be a space of an inch and a half or more (in adults) which will persist for some days. Drainage openings of suitable size anteriorly or posteriorly, or both, may be left, but it is not often necessary to put in tubes or gauze. Should an inoperable pulmonary suppurating lesion be encountered—bronchiectasis or lung abscess—it is better to resect a piece of rib with the periosteum so as to permit of long-continued drainage without a tube and without danger of valve formation and tension pneumothorax.

If the lung is bound down by tough exudate upon the pleura, this should be divided by a long vertical incision, when the lung will usually try to force its way out of its confining membrane. Peeling this away with the fingers the lung may be further freed by incisions at right angles with the first one. Hemorrhage is moderate, often absent. A slight wound of the lung tissue is not serious. Tough adhesions of the lung to the chest wall had better not be disturbed unless they are capable of being divided between ligatures. The loose flaps of membrane peeled from the lung may be cut away, and there should be no special effort made to denude every portion of the lung's surface.

During the procedures just described secondary abscesses may be found and turned into the main cavity. Sometimes the lower lobe of the lung is adherent to the diaphragm. This adhesion should be loosened with the greatest caution for fear of entering the abdominal cavity. The authors have several times encountered between lung and diaphragm collections of pus which must have caused serious complications had they not been emptied.

Having mobilized the lung the wound is closed with tubeless drainage as described. This mobilization and the exploration through the large incision, or major thoracotomy, is not advised as a primary procedure for the desperately ill patients. It should follow minor thoracotomy, the operation for immediate relief.

When the physical signs and the radiograph indicate the presence of localized intrapleural abscess, whether interlobar or not, the operation must be planned accord-

ing to the situation of the disease. Often the costal pleura forms one wall of the abscess, and in these circumstances ribs directly over the pus may be resected, trying to avoid infecting the general cavity. The case is then treated as an ordinary abscess. It has been found desirable to remove a section of at least one rib with its periosteum so that this abscess can be treated by packing with gauze, and later, if necessary, by drainage with a short tube. The removal of the periosteum with the rib prevents the rapid growth of deforming bony bridges which so frequently interfere with proper drainage. Four of these cases thus treated recovered.

THE TREATMENT OF FRACTURES OF THE FEMUR WITH HODGEN'S SPLINT.

EVE (*American Journal of Surgery*, July, 1916) writes as an earnest advocate of the Hodgen splint, which he considers applicable to any fracture of the femoral neck or shaft, in both simple and compound fractures.

The splint can be made by any blacksmith, the material being one piece of 3/16-inch brass or iron or No. 4 wire. The distal end is six inches wide and the proximal eight inches, and this end is closed by an arch to pass over the thigh. The length of the splint is 36 inches. On the top of the frame four small loops are placed, two on each side, one pair nine inches from the proximal end and one pair ten inches from the distal end. These loops are for the supporting cords or straps. Twelve inches from the proximal end the splint is bent to an angle of about 170°. This will allow the limb to become partially flexed. Four school-straps or cords equipped with tent blocks are passed through the supporting loops on the splint and are passed through an iron ring about 12 to 14 inches above the frame. A sash cord is attached to the ring, which is swung from the ceiling just below the end of the bed or some support not connected with the bed.

A piece of domestic or light canvas placed over the splint to form a hammock in which the limb may rest is pinned on either side with safety-pins. The limb is prepared the same as for the application of a Buck extension, with two- or two-and-one-half-inch adhesive plaster. The plaster extends about eight inches beyond the heel on each side, and the ends of these are attached to the distal end of the splint or the adhesive. The elevation of the bed gives counter-traction. The splint is slung over a trestle or upright, and by means of scales placed in the suspending apparatus the amount of traction is measured. First the weight of the limb is taken by direct upward lift. Then the line of pull is moved downward away from the point of suspension until an additional fifteen or twenty pounds are registered. The leg is abducted in degree according to the seat of fracture.

Eve reports thirty cases thus treated, twelve of the neck and eighteen of the shaft, with three deaths. Four of the twelve cases of fracture of the femoral neck had no shortening, and the remaining averaged half an inch; one had an inch. In the majority of cases of fracture of the shaft of the femur there was no shortening and the function was good.

CEREBRAL SYPHILIS.

KARPAS (*Interstate Medical Journal*, August, 1916) before considering the clinical phenomena of the various groups of cerebral syphilis describes the changes in the cerebrospinal fluid and blood in such conditions.

There are five important reactions: (1) Lymphocytic phenomenon; (2) the globulin content; (3) the Goldsol test precipitation; (4) the Wassermann test of the fluid; (5) the Wassermann test of the blood.

The more intense the process, the greater the lymphocytic count. An increased globulin content is a feature frequently accompanying the lymphocytosis. The precipitation of the Goldsol test is of pathognomonic significance in cerebral syphilis. The Wassermann test gives a positive reaction both in the blood and fluid. However, in old cases, the Wassermann test may be negative

both in the blood and fluid, especially in the latter. Fehling's reagent is reduced in all forms of nervous syphilis except in cases in which a mixed infection is present.

The presence of spirochæta pallida in the cerebrospinal fluid is very difficult to demonstrate.

For practical purposes, and particularly for therapeutic indications, it is deemed advisable to divide cerebral syphilis into the following groups:

1. Meningitic: (*a*) acute, (*b*) chronic.
2. Gummatous.
3. Endarteritic.
4. Mixed.
5. Degenerative.

The acute form of syphilitic meningitis presents certain striking features which are different from the other infectious forms of meningitis. It is afebrile in course unless complicated by some other infecting organism. Rigidity of the neck, Kernig's sign, and photophobia are rarely manifest. Headaches, vomiting, drowsiness, and general fatigue form a part of the clinical picture. Furthermore, transitory confusional states of varying duration and intensity are of frequent occurrence. As a rule the luetic infection is relatively of recent origin.

The meningitic involvement may be diffuse or circumscribed. At the base the meningitic infection may involve one or more cranial nerves, frequently the third and fourth nerves. There are cases in which an isolated nerve, such as the facial, is involved. Optic neuritis, choked discs, and atrophy, usually secondary, may be in evidence. The Argyll-Robertson pupil is not a frequent phenomenon in this form of cerebral syphilis.

The lymphocytic count is high, and the globulin content is increased. The Wassermann test in the blood and fluid is positive. The Goldsol test gives the usual reaction.

The chronic meningitis does not run a regular course, and indeed there are no pathognomonic features to typify this condition. Not infrequently the differentiation between this form of cerebral syphilis and general paralysis is extremely difficult to establish. Likewise, in many instances the anatomico-pathological features may simulate those of general paralysis.

Gumma occurs single or multiple, but the latter more frequently, especially in the brain. It may be of osteitic or periostitic or membranous or cerebral origin. The usual site is at the base of the brain, or in the area of the left Sylvian fissure.

The symptomatic display of cerebral gumma is practically identical with that of cerebral neoplasm, but the Wassermann test in the blood and fluid is positive, the lymphocytic count is relatively high, depending upon meningeal irritation, the globulin content is increased, and the Goldsol test is present.

Endarteritic symptoms of cerebral syphilis are practically the same as in cerebral arteriosclerosis. The prodromal symptoms are headaches, dizziness, insomnia, vertiginous attacks, and general psychic alterations, manifested in irritability and reduction of intellectual activity. Huebner describes peculiar states of semi-confusion, during which time the patient may do all kinds of peculiar things for which he shows a certain degree of amnesia. Apoplectiform attacks either of a thrombotic or hemorrhagic origin, with motor disturbances, aphasic symptoms, and other focal symptoms, frequently occur.

In this group of cases the Wassermann test in the blood is usually positive, but the fluid may give negative findings.

The degenerative group includes general paralysis (cerebral level) and tabes (spinal level). In general paralysis the Wassermann test is invariably positive both in the blood and fluid. Likewise, there is a lymphocytosis of the cerebrospinal fluid, the intensity of which depends upon the degree of meningeal irritation. The globulin content is increased, and the Goldsol test gives the usual characteristic curve. The organisms have been found in many cases of general paralysis. According to Noguchi and Moore they were demonstrated "in all layers of the cortex with the exception of the outer or neuroglia layer."

The mental symptoms in cerebral syphilis

vary. In some cases the picture may simulate any of the clinical varieties of general paralysis. Again delirious confusional states, particularly in the meningitic form, are often encountered. It is interesting to note that mild confusional episodes with fabrications, transitory and recurring in nature, varying from a few hours to several days, occur in syphilitic meningitis. There are clinical pictures which are characterized by depression, agitation, later developing manic symptoms with expansive ideas. A Korsakoff symptom-complex, acute hallucinatory states, and chronic hallucinosis with delusional ideas occur in various forms of cerebral syphilis.

In considering the prognosis of cerebral syphilis, it is necessary to bear in mind the extent of the actual damage to the nervous tissue, the constitutional resistance and the reaction to therapeutic measures. In the acute meningitic form of cerebral syphilis the prognosis is relatively good, and under active and persistent treatment recurrence may be obviated. The outlook in chronic meningitis is not very encouraging because the patients do not yield readily to therapeutic measures, and furthermore defective symptoms frequently remain. In cerebral gummata, partial or even complete restoration is possible, depending, however, upon the intensity of the injury sustained by the nervous tissue. In the endarteritic form the prognostic outlook is decidedly poor.

Since the demonstration of the spirochæta pallida in general paralysis, many clinicians became infused with undue optimism regarding its treatment, and felt that by exerting a direct germicidal action on the trypanosome the disease could be actually arrested and even a cure would be possible. However, it should not be forgotten that the pathological condition in general paralysis is decidedly of a grave nature, and that even by arresting the activity of the spirochæta pallida complete or even partial restoration of the destroyed tissue is hardly conceivable. Nevertheless, this should not deter one in applying every possible antiluetic remedy to cases of general paralysis, especially in the early stages.

Briefly stated, the treatment should be directed along the lines of removing the focal symptoms, ridding the system of the poison, and strengthening the constitutional resistance.

In all cases in which the usual contraindications are wanting salvarsan and neosalvarsan should be administered. It is always wiser to begin with a small dose in order to test the patient's constitutional tolerance. On the day following the administration of salvarsan, mercurial injections or inunctions with potassium iodide should be given. It is preferable to employ mercury salicylate injections because of rapid action and general cleanliness. The first dose should never exceed a half-grain. However, the drug should be gradually increased until constitutional tolerance has been attained. In hospital work three grains a week can be used, but in private practice mercurial injections should be limited to two grains a week. In all instances the patients should be carefully watched for untoward effects. The potassium iodide should be given in increasing doses, and it is remarkable how patients with cerebral syphilis can tolerate large amounts without showing constitutional symptoms. In this relation it is important to call attention to the fact that intraspinous treatment (Swift-Ellis and Ogilvie methods) of salvarsanized serum and mercurialized serum (Byrnes) are decidedly efficacious in the treatment of cerebral syphilis. In instances where acute inflammatory symptoms are intense, it is better to control them by ordinary methods before instituting the intraspinous therapy.

Concerning the question of latent syphilis, Solomon holds that in the course of syphilis the latent period represents merely a shorter or longer remission.

A positive Wassermann reaction, indicative of latent syphilis, is an indication for careful examination, lumbar puncture, and antisyphilitic treatment.

The primary and secondary symptoms of syphilis, in comparison with the later manifestations, are relatively benign.

Adequate treatment during the period of

latency is insurance against dangerous or incurable conditions of the later stage. It is essential for the prevention of physical and mental disease.

Treatment should be continued until the patient can be declared cured.

In regard to the margin of error in the Wassermann reaction Simons-Jones-Goddard contrasted the technique and readings of two laboratories:

The results with proper technique should yield a very high percentage of agreements. In their hands this reached 93.5 per cent in 1000 tests.

Some of the error is due to the difficulty in the standardization of the sheep blood, the complement, and the amboceptor, inasmuch as higher results were obtained when both laboratories used the same reagents.

More of this error was eliminated when in addition to this the same antigen was used in both laboratories.

It is advisable that two or more specimens of Noguchi's acetone insoluble fraction antigen be used in the Wassermann reaction.

BORCHGREVINK'S EXTENSION SPLINT FOR SPIRAL FRACTURE OF THE HUMERUS.

LYLE (*Annals of Surgery*, September, 1916) describes a splint, the credit for which he gives to Borchgrevink.

This splint is simply a Y-shaped board, with a pulley at the lower end and a padded crutch for the axilla. Ordinary extension straps are applied to the arm, and these are attached to a spreader below the elbow. From the spreader a cord passes over the pulley and is attached to a doubled rubber tube by means of a wooden button. By shortening or lengthening the cord the desired amount of traction is obtained. If pressure in the axilla should arise, it can be relieved by passing a bandage over the crutch of the splint and around the perineum.

This simple splint gives an efficient, continuous extension, preserves the alignment, and can be applied with the joints in semiflexion, thus fulfilling Zuppinger's dictum, that "the muscles must be relaxed in order to obtain efficient extension."

Borchgrevink's splint works day and night and provides extension and counter-extension. An extensive experience, not only in simple but also in severe compound gunshot fractures, has led the reporter to consider this apparatus the simplest, the most comfortable, and the most efficient splint for spiral and oblique fractures of the humerus.

THE FATE OF PATIENTS WHO HAVE HAD STONES REMOVED FROM THEIR KIDNEYS.

BLAND SUTTON (*West London Medical Journal*, July, 1916) bases most of what he has to say on his own experience. He believes that methods of diagnosis and technique are now complete, and that errors in diagnosis are so unusual that patients willingly submit to surgical interference when it is certain that the kidney contains a stone. Many patients ask questions on the effect on life and on the expectancy of life when a stone is taken out of the kidney. Hundreds of men and women are living from whom surgeons have removed a kidney on account of stone. Many live unsuspicious that one of their kidneys has been insidiously destroyed by calculous disease.

Sutton quotes the case of an actor aged forty, who noticed blood in his urine after an attack of pain in the left loin. An expert radiographer obtained a deep shadow from the left kidney, but not from the right. The stone in the left kidney was so big that the writer could feel it through the abdominal wall. The kidney being disorganized Sutton concluded that the patient was "living with one kidney," and suspected, in spite of the radiographer's negative report, that the pelvis of the right kidney contained a small migratory stone. He decided to remove the left kidney through an incision in the linea semilunaris, as this enabled him to examine the right kidney and ureter, but failed to feel a stone. He removed the left kidney; it was a thin-

walled sac, containing pus and a large branched calculus. Within a month the patient left the nursing home for Margate. Shortly after reaching Margate he was seized with acute pain in the right loin, and was unable to pass water. Four days later he came to London in a condition of anuria. A few hours after his arrival Sutton exposed the right kidney by an incision in the loin, let out much urine, and passed a guide down the ureter to the bladder. Next day the patient passed urine naturally; soon he became convalescent, and went to Margate. An *x*-ray examination showed that the guide he passed down the ureter had pushed a stone, the shape and size of a cherry-stone, into the bladder. Whilst at Margate the patient passed the stone during urination, and sent it to Sutton in a pill-box. It is a curious form of retaliation that leads men and women to send renal calculi to surgeons in pill-boxes.

A large disorganized kidney stuffed with calculi rarely disturbs a patient, but a small migratory calculus, no bigger than a cherry-stone, in an otherwise normal kidney will render life unendurable by causing colic. Occasionally the ureter of the less disorganized kidney is obstructed by one of these troublesome calculi; the patient becomes anuric, and is brought, with dramatic suddenness, not only to the brink of, but actually into, the grave.

Cases are cited which illustrate an important feature in regard to tolerance—that is, the time elapsing between the onset of anuria and the onset of uremia. This is on the average about six days. It is an axiom in renal surgery: the earlier operation is undertaken after the onset of anuria, the better the results. The great danger of such men and women who have had a kidney removed for calculous disease is that at any instant the ureter of the remaining kidney may be blocked by a stone.

Sutton records the case of a London cabman as the longest survival after nephrectomy in his practice. He removed the left kidney together with stone in 1890. This patient had suffered no pain from his calculous kidney in spite of the fact that he daily jolted over the stones of London. Twenty-five years later he was readmitted into the hospital with anuria of three days' standing. The kidney was exposed by means of an incision in the loin and the imprisoned urine released. The patient made a good recovery. Anuria is usually sudden in onset in persons of apparently good health, which latter is so little influenced at first that the patients fail to recognize the gravity of their condition. Death has occurred as early as the fourth day and has been deferred until the fifteenth. Spontaneous relief due to extrusion of the stone occurs in about 25 per cent of cases.

A man in agony with a stone stuck in his ureter rolls about the bed, clamors for help, shouts, and willingly submits to operation. When the colic is replaced by anuria, he disdains surgical interference and mocks at his advisers; but as soon as uremia stalks anuria, he passively submits to what is often a useless operation.

Sutton states that in 100 patients under his own care stones were bilateral in 10. Recurrent calculi are commonly associated with septic changes in the kidney.

UNDESCENDED TESTIS.

EISENDRATH (*Annals of Surgery*, September, 1916) explains the undescended testis on the basis that it is probably due to a combination of causes, no single one of which will hit every case. It has been abundantly shown that the vaginal process of peritoneum does not play any part in the descent of the testis, this finger-like process preceding the gland into the scrotum. The testis often lies high up in the inguinal canal, and yet the structures of the cord may pass far down into the scrotum and back again along the outer surface of an empty hernial sac. As a rule every case of arrested or ectopic testis is accompanied by an inguinal hernia of the indirect variety, the sac of which is subject to as many variations in contents as any other inguinal hernia.

Eisendrath reports two cases of sliding hernia of the cecum and appendix. There

is a marked atrophy of the secretory functions of the retained testis, which begins quite early, and at puberty there is a difference between the appearance of sections from normal and retained testis. About 10 per cent of the spermatozoa-forming cells remain intact in the adult. Aside from hernia the complications of non-descent are inflammation, torsion of the testis, and tumor formation.

If the testis is within the inguinal canal, or just beyond the external ring, and cannot be brought well down into the scrotum, the operation should be done at as early an age as is compatible with the general condition of the child. The author has operated as early as two and a half years, and does not believe anything is to be gained by waiting until the age of ten to fourteen years, because of the well-recognized lack of development of the secreting tissues in the retained testis. If the testis lies within the abdomen and does not enter into the canal when the child coughs or strains, he also operates much earlier than formerly. One must not overlook those cases in children with well-developed cremaster muscles and large inguinal canals. The testis will often be found in the scrotum at first sight, but as soon as one begins to examine, the testis is pulled into the inguinal canal. These are not cases for surgical interference, unless the condition is associated with a fairly large hernia or should persist after puberty. Not infrequently the development of the sexual characteristics of the male is a very tardy one in cases of non-descent, and a syndrome resembling infantilism may be present as a temporary or even permanent condition. This association of hypopituitarism with non-descent of the testis was present in a marked degree in one of the writer's cases operated at the age of sixteen, and the infantilism persists in spite of the fact that both testes now lie well down in the scrotum. He has given pituitary extract to some of these cases without much benefit. In adults he believes that we should advise operation, because of the danger of torsion and tumor formation and on account of the accompanying hernia. The prognosis as to a possible recovery of spermatogenesis is not very good, however.

The best method of operation is that described by Dr. Bevan: The inguinal canal is opened in the same manner as in the typical operation for inguinal hernia. The testis is found lying on the outer surface of the sac and the vas and its vessels most intimately connected with the exterior of the sac. The sac, testis, and vessels are first freed from the surrounding tissues and the gubernaculum isolated, stretched out upon the fingers, and carefully divided. One must not omit a search for a possible loop of the vas, extending down into the scrotum and back again, since in adults the vas often extends to a much lower level than the testis. The division of the gubernaculum renders the manipulation of the testis and sac an easier task. With fine blunt instruments the vas and the spermatic veins are carefully separated from the sac, if possible, without opening the latter. The vas and the vessels are then held aside with a catgut traction suture. The distal portion of the sac is everted around the testis and its edges united with very fine catgut, preferably chromic. This eversion is necessary because of the frequent association of hydrocele of such a congenital hernial sac and to prevent a recurrence of the hydrocele. The proximal portion of the sac is best not ligated until the vessels and vas have been separated, as high up behind the peritoneum into the iliac fossa as possible. One must be able, after this high separation, to bring the testis down to the lowermost portion of the scrotum. If one is patient and does not exert too much force in separating the vas and its vessels well up alongside the neck of the open, *i.e.*, nonligated, hernia sac into the iliac fossa, it is surprising how mobile the vas and its vessels become, so that one can bring the testis down to the desired point without unwise traction.

The testis is now held at the lowermost portion of the scrotum by an assistant, while a catgut purse-string suture is in-

serted through all of the structures at the external ring. The cord lies behind this suture, which thus holds the testis and cord in the scrotum without any compression of the vas or its vessels. The remainder of the operation consists in the repair of the inguinal canal as for hernia without transplantation of the cord.

THE TECHNIQUE AND MANAGEMENT OF OPERATIONS ON THE STOMACH.

CRILE (*Annals of Surgery*, September, 1916) in the course of remarks on this topic dwells particularly on the circumstance that life is possible only in an alkaline medium and urges that efforts be made to increase the reserve alkalinity, and to diminish or control the production of acids in the operation itself.

The reserve alkalinity may be increased by administering approximately 2000 Cc. of normal saline solution subcutaneously the afternoon and evening before and on the morning of the operation; and giving approximately 100 grains of sodium bicarbonate by mouth or by rectum.

He regards as the most important preoperative procedure a night of natural or artificial sleep. Postoperatively he advises normal saline solution subcutaneously until food is taken and a 5-per-cent solution each of sodium bicarbonate and glucose by the Murphy drip; early propping in bed, early rising from bed, and early return to home. In doubtful cases gastrojejunostomy should precede resection of the stomach. The loop of jejunum should be long enough to lie easily and comfortably. In the large majority of cases the traction of the jejunum to the left or right, or the position of the stoma in the stomach, whether vertical or longitudinal, can have no influence whatsoever upon the passage of the food in the stomach or on the propulsion of the food after it has reached the intestine. The opening in the mesocolon is best made by sharp knife dissection rather than by a blunt perforation or by a tear made by traction. The mesocolon opening is sutured an inch up on the stomach wall, so that this portion of the stomach goes down through the mesocolon like a hopper and the freedom of the ends of the jejunum is unhampered. This is preferable to suturing the mesocolon opening upon the line of suture at the stoma between the stomach and the intestines, as in this position it may produce kinking at the point of junction between the ileum and the stomach.

The first line suturing of silk or linen should be avoided. Chromic gut is used for the sutures that come in contact with the mucosa. For the peritoneal layer he uses interrupted silk sutures made as Cushing right-angled stitches. At the point where the stomach and jejunum are approximated two or three carefully placed interrupted sutures are inserted, so that the duodenum is brought in contact with the stomach wall on each side of the incision for a distance of from a half to one inch. The main suture which controls absolutely both hemorrhage and leakage is made with the shoemaker stitch, the introduction of which is facilitated greatly by the Bartlett needle and suture. The shoemaker stitch includes the entire structure and strength of the wall of the stomach and intestine.

In most cases it will be found that the gastrojejunostomy and the interval of adjustment have accomplished for these patients what the delay of a week accomplishes for fractures of the patella; what iodoform gauze packing accomplishes in the first stage of a laryngectomy; what acute salpingitis does for later salpingectomy. In each instance the protective reserves against infection are called out into the local field, and adequate local defense against infection in the later operation is thus guaranteed. Usually very few fragile adhesions will be found, and the entire operative field will be easily mobilized. The gastrojejunostomy will appear as if it were a natural opening. In most instances no pull or strain will be necessary to develop the field, and the gastrojejunostomy will not interfere with the elevation of the stomach for the resection. The stomach is carefully divided with a cautery between Payr's clamps, and the

margins of the division are sterilized with the cautery. The searing should be done so slowly that not a drop of blood will appear on the surface. But another and most vital purpose is achieved by this cauterization. One of the commonest dangers in operations for cancer anywhere is that of cancer implantation on the fresh tissues. The searing makes a dry charred surface which cannot sustain cancer growth. Therefore the cautery sterilizes against pyogenic infections and against cancer growth and prevents bleeding—three of the most important considerations in gastric resection. As in the gastroenterostomy, protection against leakage or hemorrhage is secured by the shoemaker stitch, and to make assurance doubly sure a special invaginating silk stitch is put around each angle with a final separate layer of right-angle silk stitches. The duodenal end is inverted by a purse-string suture.

The total number of operations on the stomach in the Lakeside surgical records are 468. Comparing previous results with those since the foregoing principles have obtained, Dr. Lower and Dr. Crile have performed, up to May 1, 127 operations. In this series there have been two deaths.

PROSPECTS OF SURGICAL TREATMENT IN MENINGITIS.

NAFFZIGER (*California State Journal of Medicine,* August, 1916) notes that the fluid output of the choroid plexus may be under the conditions present in meningitis approximately equal to the output of the kidneys in each twenty-four hours. The absorption is directly into the blood stream, the portion passing into the lymphatics being so small as to be negligible.

There are several reasons for the production of intracranial pressure. All of them have in common an increased amount of intracranial fluid. Certain substances increase the rate of secretion, such as of anesthesia, alcohol, the toxins of nephritis, pilocarpine, extracts of the choroid plexus itself and extracts of many other organs.

Bacterial infections of the meninges have the effect of increasing the choroid secretion. The increased production of fluid then is the first factor in the production of pressure. In itself it is usually not sufficient to cause serious danger.

Difficulties in absorption are more common. There may be obstruction to the outflow of fluid from the ventricles. This occurs most often from deposits of lymph and pus at the tela choroidea inferior, blocking the openings of the fourth ventricle. In such cases dilatation of all four ventricles follows. More limited accumulations occur if the block is in the iter or at either of the foramina of Monro.

In these cases of obstructive hydrocephalus surgical treatment offers much the best promise. This applies to all the infections of the cerebrospinal spaces whatever the nature. Obstructive hydrocephalus occurs frequently in the epidemic variety of meningitis and accounts for a considerable number of the deaths. Flexner's serum will do much toward combating the infection, but obviously cannot overcome mechanical obstacles. The removal of the obstruction, or at least removal of accumulated fluid, by ventricular puncture and the introduction of serum into the ventricles is frequently necessary.

Intracranial pressure arises from one other cause. The normal outlets for the absorption of the cerebrospinal fluid are through Pacchionion granulations and other arachnoid villi and through the perivascular spaces. It should be remembered that these outlets may become blocked by infectious products. In these we have a type of obstruction comparable to that found in the so-called idiopathic or essential hydrocephalus. There is a fault at the place of ultimate absorption, but no block to the outflow of fluid from the ventricles. In this variety the futility of ventricular puncture to lessen intracranial pressure is obvious. Ventricular puncture in these cases may be needed, however, to introduce sera. The practical point is this: with marked or rising intracranial pressure in meningitis we must differentiate the cases with a ventricular block causing internal

hydrocephalus from those having a general wide-spread accumulation of fluid from obstructed points of absorption. The former —that is, the cases of internal hydrocephalus—are most readily relieved.

The work of Dandy and Blackfan in differentiating the varieties of hydrocephalus in infants suggests that we may be helped similarly in meningitis. Phenolsulphonephthalein introduced by spinal puncture should appear normally in the urine in about ten minutes. With faulty absorption as in meningitis it might prove to be much delayed.

The surgical treatment of meningitis has from time to time been revived and strongly advocated. The methods adopted have varied. Lumbar laminectomies with continuous drainage have been performed for the relief or cure of the disease by Barth, Horsley, Rolleston and Allingham, Wynter, Cushing, and many others. Leonard Hill advocated openings into the subtentorial spaces and lumbar laminectomy with through-and-through irrigations. Barr demonstrated the passage of solutions colored with methylene blue through the spinal meninges. Murphy expressed some enthusiasm for this plan of treatment. Drainage through the lumbar meninges without operation, but by the use of large needles or trocars, has been frequently performed, particularly by Gorse.

The most recent impetus to the surgical treatment was given by Haynes and Kopetsky in 1912, when they strongly championed drainage of the posterior cistern. Their strong advocacy of the method has not been justified by the results of this treatment. A considerable number of reports of cases treated by the Haynes operation have accumulated in the last four years. They are not encouraging. With comparatively few exceptions there has been a fatal outcome. Life seems in some, however, to be prolonged.

The author's personal experience with this operation has been limited to three cases. Two of those, both of pneumococcus meningitis, died, one on the tenth day, the other on the third day. The third, a streptococcus meningitis, died twelve hours later. One is forced to the conclusion from a small personal experience and a fairly thorough review of literature that little can be offered by this drainage operation if used indiscriminately. It is only fair to state, however, that most of the operations have been performed too late. Occasional recoveries follow early operative procedure, as in the following case: A fracture involved the middle fossa of the skull. It passed through the petrous portion of the temporal bone. Three days after the injury the patient developed headache, a stiff neck, positive Kernig, with a rise in temperature. The optic discs were hyperemic. Spinal puncture revealed a clear fluid with a cell count of seventy-five, all polynuclears. Globulin reactions present and sugar reduction absent. Immediate subtemporal decompression with drainage between the temporal lobe and petrous portion of the temporal bone was performed. This resulted in a profuse discharge. There was a complete and permanent subsidence of all symptoms in two days with prompt recovery. In this case there was no growth obtained on cultures taken from the cerebrospinal fluid.

Repeated lumbar puncture with the withdrawal of considerable fluid has its adherents. It seems definitely of value. Reports of its use in the hospitals of Europe during the present war incline one to concede it a definite place in treatment.

If one were to rely on the reported cases alone the impression would be gained that the results of lumbar laminectomy and drainage are somewhat better than from the results of the Haynes operation.

The value of the ophthalmoscopic findings as an index of intracranial pressure has been discussed in a previous paper. The swelling of the nerve head is one of our most reliable indications of subacute and chronic intracranial pressure, and it is our best guide in treatment. Frequent and detailed ophthalmoscopic examinations are most necessary, and their importance cannot be overestimated. As to the indications for surgical treatment:

Frequent lumbar punctures in general meningeal infections with the slow withdrawal of fluid varying in amount from 10 to 50 Cc. are of value.

Infections due to the diplococcus intracellularis which do not respond readily to Flexner's serum intraspinally should have the benefit of intraventricular injections.

Those cases showing a definite swelling of the optic disc, especially if it is progressive or is an outspoken choked disc, demand relief for their pressure.

If this be due to an internal hydrocephalus it can best be relieved by the Haynes operation or by a callosal puncture. If the pressure be due to faulty absorption of the intracranial fluid little can be expected by any operative procedure. Intermittent drainage through a small trocar inserted in the lumbar spaces is well worth a trial.

OBSERVATIONS OF THE OCCURRENCE OF SYPHILIS IN THE UNIVERSITY OF MICHIGAN OBSTETRIC AND GYNECOLOGIC CLINIC.

PETERSON (*Surgery, Gynecology and Obstetrics,* September, 1916) summarizes on this subject as follows:

Only by routine Wassermann tests will the obstetrician and gynecologist best serve the interests of his patients.

Especially is this true in hospital practice where even careful histories fail to arouse suspicion of latent syphilis.

Out of 2000 in-patients in the University Hospital excluding two services the proportion of syphilitics was 6 per cent.

The nature of the hospital material will determine the percentage of lues, but in the average hospital the ratio will not be far from 8 to 10 per cent if the entire hospital population be included.

The same holds true for the proporiton of syphilis in any special clinic, the percentage varying according to the nature of the material.

The percentage of lues in 381 cases in the University of Michigan was 4.7, as shown by the Wassermann reactions and expert physical examinations.

In 18 cases of syphilis among the number examined only eight gave a history of lues.

In only the same number were there positive physical signs of lues.

As shown by the histories of the 18 cases there is a greater chance for the syphilitic mother treated by salvarsan and mercury to give birth to a living, full-term child than were no treatment given during pregnancy.

The new-born infants of the mothers so treated do not give positive Wassermann reactions, although undoubtedly they are syphilitic and later probably will show signs of the disease.

A certain proportion of the new-born children of untreated syphilitic mothers will give positive Wassermanns.

Out of 390 gynecologic patients subjected to the Wassermann test, 22, or 5.6 per cent, gave positive reactions.

In only five of the 22 luetic patients was there a history of syphilis.

Hence the importance of such examinations, or a serious general disease will be overlooked and the gynecologic patient will remain uncured.

CULTURES FROM PHYSICIANS' CLINICAL THERMOMETERS.

RAMSEY and SCHOBERG (*St. Paul Medical Journal,* July, 1916) took 82 cultures from thermometers used by physicians in their daily practice and carried in the ordinary case in the pocket. Thirty-three were sterile and 49 contained organisms of various kinds. Streptococci were present in 13, staphylococcus albus and citreus in 13, pneumococcus in one. Ordinary washing with 95-per-cent alcohol will not render a clinical thermometer free from secretion after using. It was found that thorough washing with running water and rubbing, then rubbing off with sterile cotton wet with 95-per-cent alcohol, was efficient. Washing with soap and water followed by drying on a clean towel did not sterilize. It is suggested that the thermometer case should contain some antiseptic such as formaldehyde or alcohol.

REVIEWS.

A Text-book of Practical Therapeutics. With Especial Reference to the Application of Remedial Measures and Their Employment upon a Rational Basis. By Hobart Amory Hare, M.D., B.Sc. Sixteenth Edition, Enlarged, Thoroughly Revised, and Largely Rewritten. Lea & Febiger, Philadelphia, 1916. Price $4.75.

In the Preface to the 16th edition the author uses these words:

"The favor which has been extended to previous editions of this book has stimulated the author in the endeavor to keep it not only up to date but to make it more useful to active practitioners of medicine.

"In the twenty-six years since the first edition appeared the advances made in the treatment of disease have been greater than ever before. New methods of reaching an accurate diagnosis have enabled us to make treatment more direct, and the introduction of new drugs, or the modification of old ones, has aided in the attaining of good results.

"The original idea when writing this book was not only to describe the use of drugs in the treatment of disease, but to explain their value by indicating their physiological effects, and this point of view has been adhered to. While in some instances our methods have to rest solely on bedside experience, in many others the reason why they do good has become apparent.

"In the present edition the official preparations of the new United States Pharmacopœia and the new British Pharmacopœia have been introduced; attention has been paid to the changes in strength of galenical preparations, and every article has been revised in an endeavor to bring the text up to the views generally accepted by the best physicians of the day as they are found in current literature.

"As in all previous editions the articles in Part IV on Diseases of the Eye have been written and revised by Dr. George E. de Schweinitz, Professor of Ophthalmology in the University of Pennsylvania; those upon Diseases of the Puerperal State by Dr. Barton C. Hirst, Professor of Obstetrics in the University of Pennsylvania; those upon Antisepsis, Gonorrhea, and Syphilis by Dr. Edward Martin, Professor of Surgery in the University of Pennsylvania. These articles have added greatly to the value of earlier editions, and the author desires to thank his long-time friends for their constant interest in their preparation and revision.

"Simultaneously with the appearance of this edition the third Chinese edition has been published in Shanghai."

Applied Immunology. With an Appendix on Serum Treatment of Hemorrhage, Organotherapy, and Chemotherapy. By B. A. Thomas, A.M., M.D., and R. H. Ivy, M.D., D.D.S. Illustrated, Second Edition, Revised. J. B. Lippincott Company, Philadelphia, 1916. Price $4.00.

For a book dealing with such a technical subject to reach its second edition in the brief space of about a year indicates that its contents have proved of great interest and value, not only to the laboratory worker and specialist, but to the general practitioner as well. We have noticed with pleasure the numerous favorable reviews which have appeared since the first edition was published. Naturally, in so short a time a sufficient number of advances have not been made along these scientific lines to make it necessary to introduce much new material. It will be recalled that the object of the volume is to give information in regard to the practical application of sera and bacterins for prophylactic, diagnostic and therapeutic purposes, and, in addition, to make clear to the man who is busy from day to day in the visitation of patients the practical bearing of important laboratory investigation which will enable him the more successfully to treat disease. For various reasons there has been a tendency on the part of many members of the medical profession to rely rather upon advertising

literature in their use of these new therapeutic agents than to study the various contributions in different journals which have been published as a result of research. This is because it is necessary for the busy man to read brief summarizations of facts. In this book the authors have not only been successful in presenting these matters in a concrete form so that the essential facts of the subject can be easily garnered by the reader, but have been clever enough to deal with the matter so thoroughly that they cannot be accused of being superficial. The volume is timely. It will do much toward directing physicians in the proper use of these remedies, and, equally important, it will do much toward preventing their haphazard employment, which we are confident too frequently occurs at the present time.

A MANUAL OF CHEMISTRY. Being a Guide to Lectures and Laboratory Work for Beginners in Chemistry. By W. Simon, Ph.D., M.D., and Daniel Base, Ph.D. Eleventh Edition, Thoroughly Revised, Freely Illustrated in Colors and in Black and White. Lea & Febiger, Philadelphia, 1916. Price $3.50.

Simon's Chemistry is probably the most popular book dealing with this subject which has ever been published in this country. The senior author having died since the tenth edition appeared, the entire revision has been done by Dr. Base. It will be recalled that the book has been designed in every edition especially for students of medicine, pharmacy, and dentistry.

In the present edition the term milliliter (abbreviated mil) in place of cubic centimeter is used, this designation having been brought about by the U. S. Bureau of Standards, the U. S. P., the British Pharmacopœia, and the various U. S. Government publications.

The subject of physiological chemistry has become so broad that it has been deemed wise to drop it from a work of this character, and, therefore, with the exception of a chapter upon proteins, this subject is not considered in the present edition.

The section dealing with Non-Metals has been entirely rearranged, and a chapter upon Quantitative Determinations by Volumetric Methods has been included in the section devoted to Analytical Chemistry.

In looking over the pages it is not difficult to see how it has come to pass that this book has proved so popular. Physicians equipping themselves with a private laboratory cannot do better than add it to the list of books to which they will constantly refer.

THE HEALTHY GIRL. By Mrs. Joseph Cunning, M.B., and A. Campbell, B.A. Oxford University Press, New York, 1916. Price $1.75.

We are told in the Preface that this book is an attempt to help the girl who is leaving school and learning to face life, to understand the most important circumstance she is likely to encounter, namely, herself. Later chapters deal, however, with school life, which seem to be more intended for mothers and teachers than for the child herself. There are seventeen chapters dealing with the Mind and Body, Work and Rest, Various Physiological Functions of the Body, Bad Habits, Open-air Schools, etc. Outline illustrations are given, and some attempt is made to give the reader rather elementary ideas in regard to the physiological processes in the body. One chapter, the fourteenth, which covers three pages, is entitled "The Medicine Chest," and gives directions for the employment of various fairly simple remedies and the treatment of a number of mild conditions. Such directions, however, are useless unless minute details are given concerning them. This is done in some instances, but in others is omitted.

THE MEDICAL CLINICS OF CHICAGO. September, 1916. W. B. Saunders Company, Philadelphia, 1916.

This issue is No. 2 of Volume 2 of these Clinics, with which, doubtless, many of our readers are familiar. In it are published clinical lectures, or articles, derived from most of the large hospital services in Chicago. The articles which will prove most interesting to the general practitioner will probably be one by Dr. Mix, which deals with Pleurisy and Gastric Spasm, the Mor-

phine Habit Subsequent to Lead Colic, and a Case of Myelogenous Leukemia; another one by Friedman upon Chronic Diarrhea; and a third by Zeisler upon the Etiology and Treatment of Acne. As in previous issues the large print and wide spacing make the text very easy reading.

THE MEDICAL VISITING LIST OR PHYSICIAN'S DIARY FOR 1917. Newly Revised. William Wood & Company, New York, 1916.

For many years we have noticed in these pages the regular appearance of this excellent visiting list, which occurs in several forms: One for thirty patients a week, with or without dates, costing $1.25; another for sixty patients a week, with or without dates, costing $1.50; and still another for ninety patients a week, with dates only, $2.00. There is a good deal of preliminary material of general interest in the way of antidotes, doses, estimations of the duration of pregnancy, etc., in the first thirty-one pages.

THE KINETIC DRIVE: ITS PHENOMENA AND CONTROL. By George W. Crile, M.D. Edited by Amy F. Rowland, B.S. Illustrated. W. B. Saunders Company, Philadelphia and London, 1916. Price $2.

This brochure is summarized by its distinguished author as follows: "The kinetic theory harmonizes many facts in the great clinic of life as well as in the restricted clinics of medicine; it emphasizes the value of a mechanistic view of life in the study of both normal and pathologic processes; and it suggests a philosophy of life by means of which self-preservation may be secured through kinetic control.

According to the kinetic theory, the resemblance of many normal and pathologic processes—exertion, emotion, infection, autointoxication, etc.—suggests that the mechanism by which they are produced is identical with the mechanism by which the transformation of energy and the elimination of acid by-products are accomplished; that is, that these conditions are caused by variations in the kinetic drive.

Since an excessive kinetic drive may be the result of the simultaneous action of various factors in the external and the internal environment, then the control of one or more of these factors will lessen the drive and mitigate its effect. Thus the substitution of hope for fear may relieve the organism of one driving factor and by so much relieve the strain upon the kinetic system. In other cases the depression of the activity of the brain by morphine or by nitrous oxide anesthesia controls an acute kinetic drive.

For still other cases in which disease has resulted from the physical injury wrought in certain organs by an excessive drive, it is proposed as a problem, not as an accomplished fact, that the activating organs of the kinetic system, the adrenals and the thyroid, be reduced in size and that their communication with the driving organ—the brain—be in part severed. By an analogous method the result of an intense kinetic drive—Graves's disease—is modified or cured; the accompanying cardiovascular, cardiorenal, myocardial, and neurasthenic symptoms are coincidentally relieved, and sugar tolerance is raised.

If Graves's disease, which is due to the overspeeding of the kinetic system, is thus relieved by partial excision of one of the driving organs, the thyroid, this mechanistic treatment effecting simultaneously the cure of the conditions brought about by the driving power of Graves's disease itself, then the logical conclusion is that these allied diseases when brought into existence by other kinetic drives may be mitigated or cured by a dekineticizing operation.

This is offered as an unsolved problem suggested by a large amount of experimental data.

The elaboration of this summation is one of vivid interest, backed by both experimental and clinical observation; an irrefutable logic, if some premises be accepted; and attested by the circumstance that the author has performed fourteen operations upon patients with chronic diseases resulting from excessive kinetic drives—11 hopeless epileptics, on three cases of Raynaud's

disease, and finally on an advanced diabetic. All made good operative recoveries. The operation performed in different stages comprised the excision of one adrenal, the excision of approximately three-fourths of the thyroid, and the division of the cervical sympathetic trunks.

Of the epileptics none were cured, but all made good recoveries, and the severity of the attacks and the length of the interval showed an increased sugar tolerance. In no case were normal functions interfered with. Three cases of Raynaud's disease give a fair promise of recovery. It is regarded as most important that the operation be performed under nitrous-oxide-oxygen, rather than under the lipoid solvent—ether. The case of diabetes after a period of six months had exhibited an amount of sugar in the urine ranging daily from 9 to 202 grammes and subject, first, to section of the right cervical sympathetic and three days later the left adrenalectomy, and 17 days later excision of the left cervical sympathetic with partial thyroidectomy. The sugar lessened and then disappeared. It should be noted that the patient is employing the Allen treatment.

This book suggests a range of vision beyond that of the ordinary man. If this vision be entirely astigmatic there lies in the range a rich promise for humanity.

DISORDERS OF THE SEXUAL FUNCTION IN THE MALE AND FEMALE. By Max Hühner, M.D. F. A. Davis Company, Philadelphia and London, 1916.

This book, written with a certain ingenuous frankness, deals with Masturbation, Impotence, Pollutions, Priapism, Satyriasis, Nymphomania, Frigidity, Vaginismus, Dyspareunia, Absence of Orgasm of the Female during Coitus, Enuresis, the Evil Consequences of Withdrawal, Continence, and Some Unusual Forms of Sexual Neuroses.

The subjects embraced are of what might be called universal interest, and are in many instances taken up with a minute detail and with a shrewd common sense, which makes both entertaining and instructive reading.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

With the passage of this month we are beginning to enter on wintry weather, but so far there has been no real break, and with the exception of a few wet days the sun has been shining nearly every day. With the lengthening nights thoughts are turning toward the question of whether the air raids will be continued or not. Opinions are divided as to whether the recent losses of air-ships will lessen the liability of attack, or whether a big center like London, which is presumably easy to detect, will remain an attraction to the air-ships. Occasionally one comes across evidences of their work in quite an unexpected manner. When taking a walk in the country this month, I passed through a village which had received a visitation, and where one end of the church had been hit by bombs but without doing any great amount of damage, although one corner will need extensive repairs. The result was interesting in one way as showing the great thickness of the ancient walls, which were approximately two feet thick. The force of the explosion had produced a certain amount of damage to all the windows in the church. These were of the lead-latticed type, and in the same window were found panes blown out after smashing, and also the latticework bent sometimes inward and sometimes outward in a very bizarre manner. The windows in the neighboring houses had evidently suffered likewise, as a considerable amount of new putty, and in some cases new slates and tiles, were visible. Another bomb in this village had dropped near the park gate, in

which were numerous perforations of wood-work. With a little patching the gate will be able to continue, and the gate-posts have not moved to any extent. Possibly the new order for the early closing of shops may be connected with the air raids, as a deal of shopping is done in the evening. Under the new regulations, which will come in shortly, the shops will have to be closed at seven, with a few exceptions, such as restaurants. This will certainly remove an inducement for people to be out late. This order, however, will have a far wider effect, in that it will relieve the workers and considerably reduce their hours, which is all to the good of the population in general.

Women's labor is still in increasing demand, and generally the supply is sufficient for the demand. In certain areas, however, where in normal circumstances female labor is employed, for instance in the cotton manufacturing districts, it is found that women are insufficient in number to replace the men, especially now that more looms are being worked. In these areas it has been found necessary to organize committees to find out by visitation those who were formerly cotton operatives and to get them to offer to return temporarily. In one instance these investigations resulted in the employment of forty looms which would otherwise have remained idle. As more men are being called out, such a process will have to be extended to many other districts outside the cotton areas. In another department of labor the results have not been quite satisfactory. A training school for girl farm workers established by one of the county agricultural committees has been closed on account of the disappointing results obtained. The girls have largely come from towns, and on arrival their imagination was filled with the idea of green fields and of an easy life, but their enthusiasm evaporated when faced with the actual life on a farm with the mud and filth and the other concomitants. Learning to drive or to milk was readily accomplished, but the actual monotony of the daily operations became intolerable. Probably too the difficulty of finding suitable accommodations played its part. The girls from the country, who were largely habituated to these circumstances, shaped better. The result, however, is that the training school has been closed.

On October 2 the Queen performed the ceremony of opening the extension of the London School of Medicine for Women, at which the preliminary part of the medical education of women who ultimately pass on to the Royal Free Hospital is undertaken. The school was first founded in 1874, a new building was required in 1900, and the present further extension has been rendered necessary by the increased number of women who at the present time and owing to the present circumstances are now entering as medical students. The new building is admirably equipped with laboratories for chemistry, physics, biology, and physiology, and for experimental research work. The lecture-rooms are large and airy. It is estimated that at least 90 new students can be catered for in each year, but the hospital is hardly big enough to accommodate this large number, so that the hospital authorities have had to make arrangements for some of their students to go to other hospitals to receive their final two or three years' tuition. At the present time, those whom it is impossible to accommodate at the Royal Free are sent to St. Mary's Hospital. We understand that at the end of the war the Royal Free Hospital will itself be enlarged, and will then be able to provide an increasing number of students with the final years' education. The staff of the Royal Free Hospital consists for the greater part of men, but there are at least two hospitals in London—the new Hospital in Euston Road and the South London Hospital—which are entirely staffed by women. At present neither of these hospitals has a medical school attached, but they provide a number of appointments—clinical assistants and resident medical officers—which are filled by women. Owing to the lack of candidates a large number of resident appointments at other hospitals which have hitherto always been filled by men are now

thrown open to and occupied by women doctors. At the present time there are over 1100 qualified women. This is a great record of achievement for a movement which was instituted about fifty years ago, and which met with serious opposition at the hands of the teaching and licensing authorities as well as the general public. It should not be forgotten that a women's hospital corps was established in Paris, and finally migrated to Endell Street, London, where 520 beds are occupied by military patients. Most excellent work is being done by the Scottish women's hospitals in France, in Serbia, and more recently further East.

In spite of the heavy fighting in France and elsewhere, London does not seem to be overfilled with wounded. This, as explained previously, is probably due to the fact that more extensive accommodation is provided in the country districts than formerly. An increase will, however, have to be provided in accommodation for officers. In a few cases private houses which have hitherto been given over to the treatment of invalided officers have been closed, and at the same time the casualty list amongst the officers shows a greatly increased number of wounded, and it is bruited that one or more large hotels may be taken over by the government to provide the necessary accommodation. This will be an advantage in centralizing the cases hitherto treated in private houses or nursing homes, where numbers varying from eight to thirty have been accommodated. This distribution causes a considerable waste of time to the medical officers and attendants. Of course all the younger men are attached to the R.A.M.C. and are not employed in looking after such cases. These duties fall upon the older medical men, who for the greater part carry on the work on a voluntary basis, and in London in conjunction with their private and hospital work. Considerable time is wasted in getting from one hospital to another when these are situated in private houses. So far no intimation has been received that these smaller hospitals will be closed, but as soon as the extra beds are available this is likely to happen.

Throughout the year nearly every month and frequently successive weeks certain days have seen the streets invaded by a number of young ladies carrying trays of flags. Happy hunting grounds are found in the neighborhood of large hotels, railway stations, and main thoroughfares such as Oxford Circus, Trafalgar Square, etc. The object of these flag days is to collect money for different objects. Thus we have had Russian, French, Serbian, and Italian days, and so forth. They are beginning to fall a little flat, and the general public tend to regard these days as a nuisance which has to be put up with. No one is complete on such a day until he can show one or more of these emblems. This month, however, the country was considerably aroused by the initiation of a Red Cross day. The actual figure collected has not yet been announced, but there is reason to believe that the results were excellent. It is further reported that sundry neutrals, some of whom originated on the other side of the Atlantic, felt generously disposed on that day, for all of which we are grateful.

In past years cases of scarlet fever have always outnumbered the cases of diphtheria admitted to the fever hospitals in London. This year we have the very unusual fact of the cases of diphtheria outnumbering those of scarlet fever. As a result of isolation and hygienic methods, scarlet fever has become a disease very much less to be feared than formerly. There are still practitioners in this country who remember the time when scarlet fever generally took a malignant form, and who relate that they passed through a village in the morning where no one was reported ill, and on the same evening there might be two or three cases of people who had died from malignant scarlet fever. It is probably quite justifiable to conclude that the reduction in the virulence of this disease is chiefly due to the methods of isolation adopted, for even in the past ten or twenty years the disease has shown milder characteristics.

INDEX TO VOLUME XXXII, THIRD SERIES.

(WHOLE SERIES, VOLUME XL.)

Abdominal section in the treatment of placenta previa 237
pain treated with adrenalin per os 798
skin-flap in radical amputation of the breast 369
wounds, gunshot—treatment of 288
in war, treatment of 249
penerating 679
perforating 370, 371
Abortion, inevitable and incomplete—the use of pituitrin in 119
Abscess, paranephritic 61
peritonsillar—radical treatment of 293
Abuse of pituitary extract 483
of tincture of iodine 722
Acetonuria and its indications for treatment 477
Acid autointoxication in infancy and childhood 572
Acidosis, a discussion of 586
its causation and treatment 259
occurring with diarrhea 557
treatment of in diabetes 297
Acne, vaccine treatment of 651
Action of drugs on the ureter 584
Active immunization with diphtheria toxin-antitoxin 422
Acupuncture as a therapeutic procedure 576
Acute infectious diseases, collapse in the 171
otitis media 93
poliomyelitis, treatment of 503
Adenitis, gummatous cervical 205
tuberculous—treatment of by Roentgen rays 717
Adrenalin and novocaine as a local anesthetic 186
a novel method of using in resuscitation 701
in poliomyelitis 645, 727
in the treatment of infantile paralysis 641
per os for abdominal pain 798
the true position of 173, 183
the use of, and the combination of local and general anesthetics 421
the value of in poliomyelitis 704
Adrenals, the pathological action of arsenicals on the 257
Advantages of McDonald's solution as an antiseptic 863
Affections of the eye, common 408
Alcohol and carbolic acid 563
and narcotics 769
and sugars, the rapidity with which they may serve as nutriment 863
injections in the treatment of pruritus ani 731
Alkaline treatment of hepatic failure in yellow fever, malaria, and other conditions 713
Allen treatment in diabetes mellitus 24, 335
of diabetes and caution 395
Alopecia and its treatment 346
areata, treatment of 411
Aluminum salts, the effect of prolonged feeding of 406
Alveolar infections, deep-seated 286
osteomyelitis (pyorrhea alveolaris), treatment of with vaccines 875
Amebic dysentery, emetine in the treatment of 26
treatment of 330, 413
of carriers of 730
Amentia, the compluetic reaction in 824
Amino-acids, significance of the 791
Ammonia as an enema 493
Amputation stumps, functional status of in war 889
Analysis of cases of tetanus treated in home military hospitals 209
Anaphylaxis, observations on the treatment of 648
the phenomenon of its clinical significance and practical utilization 843
the relation of asthma in children to 871
Anastomosis of the vasa epididymis in sterility 204
Anatomical and clinical studies of fractures of the neck of the femur 603
Anatomy of the renal pelvis, some studies on the 823
Anemia, pernicious—late results of splenectomy in 880
Anesthesia and analgesia, some observations on 584
certain points concerning 246
infiltration 761
in labor 388
for enucleation of tonsils 569
the effect of on anaphylaxis 648
Anesthetic, choice and technique of the 185
Anesthetics, the influence of on the temperature of the body 861
Angina, Vincent's 420
Aniline poisoning, industrial 789
Ankle injuries 326
Ankylosis following gunshot injuries of joints, positions of election for 662
Anorectal surgery, conclusions regarding the limitations of local anesthetics in 213
Anterior poliomyelitis, acute—the treatment of in the preparalytic and postparalytic stages 639
acute—treatment of the paralysis following 562
the treatment of 725
the treatment of the acute stage of 644
urethritis, chronic 238
Anthrax, treatment of 511
Antibody formation and reaction produced by mixed vaccines 720
Antidotes in mercuric chloride poisoning—an experimental study 481
Antirabic treatment, Pasteur—paralysis during 659
Antitetanic serum injections in the prevention of tetanus 173
Antitetanus serum, the therapeutic possibilities of 711
Antitoxin treatment of diphtheria, the newer 22
of tetanus, intraspinous 293
Aperiosteal stump and its care 678
Appendectomy, infiltration anesthesia for 762
Appendicitis, acute, in children 122
in early typhoid fever, diagnosis of 208
Applicability of bacterial vaccines in treatment 615
Army pest, the louse as an 624
Arnold, J. O.: Some Practical Points on the Treatment of Eclampsia, with Report of Illustrative Cases 381
Arsenicals, the pathological action of on the adrenals 257
Arsenic kidneys, histologic changes in 201
Arterial blood-pressure, the influence of neosalvarsan injections on the 105
Arteriosclerosis, danger of baths in patients suffering from 799
Arthritis, rheumatoid—radical treatment of 401
the treatment of 42
Articular rheumatism, chronic—vaccine treatment of 651
Artificial feeding of infants, simple guides for the 409
whole milk in the 121
pneumothorax in the treatment of pulmonary tuberculosis 43
in tuberculosis 175
the dangers of 328
Ascites, plastic drainage of 131
Asphyxia, resuscitation in various forms of 849
Aspirin and quinine—does the combination produce a toxic substance? 620
Associated pulmonary and cardiac disease 95
Asthma and bronchitis treated by autogenous vaccines 431
arthritis, and gonorrhea, the treatment of by phylacogens 808
in children: its relation to anaphylaxis 871
infantile—treatment of 52
Atmospheric conditions, recent progress in our knowledge of the physiological action of 800
Atropine and permanent bradycardia 196
in the treatment of cholera 429
of gastric disorders 84
of iritis 188
treatment for the exudative diathesis in infancy 107
of dysmenorrhea 339

Aural complications of influenza..... 165
discharge, indications for operative interference in cases of... 271
disease, some phases of..... 609
Auricular fibrillation: its recognition and treatment 808
Autogenous vaccines in the treatment of bronchitis and asthma..... 431
Autoserum injections in skin diseases..... 646
treatment of pellagra..... 488

Bacillary dysentery, serum treatment of.... 495
treatment of 415
Bacillus typhosus, stock vaccine in infection by the 506
Bacterial power acquired by the serum after the administration of salvarsan or neosalvarsan 350
vaccines, the applicability of in treatment 615
Bactericidal action of normal and infected sera upon different microbes..... 356
Bacterin treatment of certain chronic pyogenic dermatoses 337
of pneumonia 158
Barker's method of spinal anesthesia..... 425
Bate, R. Alexander: Observations on the Medical Aspect of Cholecystitis and Cholangitis 765
Baths, danger of in patients suffering from arteriosclerosis 799
Beck, Harvey G.: Hypothyroidism, with Report of Cases 533
Beriberi, infantile—treatment of..... 340
with special reference to prophylaxis and treatment 579
Bichloride of mercury injections, intraspinal, in syphilis 708
poisoning, chemical, studies on a case of 861
mercury elimination in 407
Biochemical causes of sterility in women... 465
Bird, Frank: Report of a Case of Teatnus... 6
Birth rate of England declining..... 683
Bismuth paste in the treatment of fistula... 597
Bitter tonics, the action of on the secretion of gastric juice 323
Blackwater fever, the treatment of..... 268
Bladder tumors, high-frequency currents in the treatment of 137
the relation of to the cancer problem 242
Blood flow in normal human subjects, the effect of caffeine upon the..... 130
measurement, diastolic—the value of in diagnosis of circulatory disturbances. 354
pressure, high—treatment of..... 54
in hemorrhage and its restoration...657
tattooing of the skin from hypodermic injections of morphine 176
transfusion 589
direct 203
in children, the citrate method of.. 266
indications for 483
volume, regulation of the after injections of saline solutions..... 848
Bloodletting in the treatment of inflammatory diseases of the middle ear..... 167
Body temperature, the influence of anesthetics on 861
vermin, the best methods of destroying 708
Boiled milk, the nutritive value of..... 418
Bone fractures, end results of..... 138
transplantation in ununited fracture of the shaft of the humerus 516
Borchgrevink's extension splint for spiral fracture of the humerus..... 900
Bradycardia, permanent, and atropine..... 196
Brain disease, acute and chronic—indications for and results of cerebral and cerebellar decompression in..... 825
syphilis, treatment of 111
tumor 777
Breast amputation, radical—the abdominal skin-flap in 369
Bright's disease and nephritis, the choice of climate in 637
Bromide sedation in epilepsy..... 764
Bromides in the treatment of epilepsy..... 786
of epilepsy, value of the 774
Bromoform in whooping-cough..... 842
Bronchitis and asthma treated by autogenous vaccines 431
Bronchopneumonia, the treatment of..... 156
Bulkley, L. Duncan: Dietetic and Medical Treatment of Cancer 1
Bullet wounds of peripheral nerve trunks. 367

Burns, the modern treatment of..... 57
the treatment of after battle..... 784
Burr, Charles W.: Two Cases of Cannabis Indica Intoxication 554
Bursitis, subacromial 515

Caffeine in digitalis arrhythmias..... 104
the effect of upon the blood-flow in normal human subjects 130
Calculus, renal and ureteral..... 513
Calendula, a non-poisonous antiseptic..... 805
Cancer, a diet list for..... 2
dietetic and medical treatment of..... 1
of the stomach, etiology of..... 736
of the uterus, radium in the treatment of 510
problem, relation of bladder tumors to the 242
the heart of the..... 542
the therapeutics of 431
Cancers of the pelvic organs, the action of radium on 268
of the pelvis, deep-seated inoperable—the action of gamma rays on..... 646
Cannabis indica intoxication, two cases of.. 554
the reliability of 758
sativa—is the medicinal value found only in the Indian-grown drug?..... 49
Carbohydrate indigestion 422
Carbolic acid, alcohol as an antidote to.... 563
Carbon monoxide poisoning 877
Carbuncle and hemorrhoids, the phenol treatment of 380
Carcimona of the breast and chronic mastitis, the relation between..... 665
of the urethra, primary—treatment of.. 822
of the uterus, the newer methods of treatment for 44
Carcinomas of the cervix uteri and vagina, radium in the treatment of..... 265
Cardiac and pulmonary disease, associated. 95
arrest during operative procedures, sudden—the treatment of 23
cases, an outline for the management of from the out-patient department standpoint 317
massage, a case of resuscitation by.... 447
renal, and hepatic dropsies—treatment by the Karell cure 647
syphilis, the treatment of..... 632
Cardiovascular-renal disease (arteriosclerosis) 194
Carriers of amebic dysentery, treatment of. 730
Cartilages of the knee-joint, unstable semilunar—treatment of 787
Casein-milk in infant feeding..... 113
Cases in which foot-plates fail..... 398
Casualty clearing station, dressings used in a 600
Catarrhal deafness, the preventive treatment of 38
Catgut sutures treated with potassium mercuric iodide 299
Causation and treatment of acidosis..... 259
Cause and prevention of trench feet..... 738
Causes and treatment of sterility in women. 463
Cellulitis, magnesium sulphate lotion in.... 571
Central nervous system syphilis, treatment of 891
Cerebral and cerebellar decompression in acute and chronic brain disease, indications for and results of..... 825
syphilis, salvarsan treatment of..... 897
tumors, general principles in the treatment of 595
Cerebrospinal fever 32
meningitis 297
syphilis, treatment of by mercurialized serum 192
Certain points concerning anesthesia..... 246
Cervical adenitis, chronic, and tonsils..... 58
lymphatics, tuberculosis of the..... 874
Chemical aid in securing the spirocheta pallida from syphilitic lesions..... 334
studies on a case of bichloride poisoning 861
study of woman's milk, especially its inorganic constituents 109
Chemistry of cow's milk and other products used in infant feeding 489
Chemotherapy in syphilis, the rationale of. 437
of tuberculosis 785
Chenopodium in the treatment of uncinariasis 201
Chest wounds, gunshot—surgical treatment of 443
perforating and penetrating, with severe hemorrhage 746

Chloride of magnesium for dressings..... 143
Chloroform and ether anesthesia..... 870
in labor 878
syncope, clinical—relation of ventricular fibrillation to 48
Choice and technique of the anesthetic.... 185
of climate in cases of Bright's disease and nephritis 637
Cholecystectomy 520
Cholecystitis and cholangitis, observations on the medical aspect of 765
Cholelithiasis, dietetic management of hypercholesterinemia in cases of..... 879
treatment of 596
Cholera, intravenous saline in—a contraindication 651
treatment of by the addition of atropine to the hypertonic and permanganate treatment 429
Circulatory disturbances, the value of diastolic blood measurement in diagnosis of 354
efficiency, pulse-pressure as a measure of 869
Citrated milk feeding for infants..... 654
Citrate method of blood transfusion in children 266
solutions in the prevention of peritoneal adhesions 433
transfusion for hemorrhage..... 636
Clark, William L.: The Treatment of Nevus Flammeus (Port-wine Mark) and Allied Conditions by Filtered Ultra-violet Rays, Employing the Compression Method of Application—Report of Ten Cases with Two Illustrations 312
Cleft palate, surgery of..... 146
surgical anatomy of 135
Climate in the treatment of pulmonary tuberculosis 618
Clinical actions of veratrum, further observations on the 587
experiences with coagulose in cases of hemorrhage 243
experience versus experiments..... 851
observations on luetic disease of the heart and aorta 427
results of 1000 intravenous injections of galyl 360
significance of pyelitis..... 282
Coagulose in cases of hemorrhage, clinical experiences with 243
Cocaine, the action of..... 130
Cockroach: its destruction and dispersal.... 647
Cohn, Adolph: Prevention and Limitation of Deformity in Infantile Paralysis..... 687
Cold fresh air treatment of pneumonia, historical statement of the institution of the. 153
Colds, common—the treatment of..... 714
Colectomy, final results in twelve cases of.. 602
Colic, pancreatic stone 204
Colitis, mucous—treatment of 199, 801
Collapse in the acute infectious diseases.... 171
Combination of local and general anesthetics and the use of adrenalin..... 421
of quinine with aspirin—does it produce a toxic substance?..... 620
Combined vaccinations 343
Common affections of the nose and throat—their early recognition and treatment.... 229
Comparative pharmacologic action of ethylhydrocuprein (optochin) and quinine. 351
toxicity of morphine and morphine-narcotin (narcophin) 868
Compensation laws, effect of the..... 705
Compluetic reaction in amentia..... 824
Composition and preparation of protein milk 43
Compound dislocation of the phalanges.... 532
Condensed milk and soy-bean in infant feeding 108
Conditions in which vaccine therapy may reasonably be employed 650
Congenital dilatation of the colon..... 590
syphilis, treatment of 373
Conservative treatment of the affections of the lachrymal drainage apparatus 612
of the tonsils..... 583
Control of diphtheria epidemics..... 582
of the occupational diseases..... 58
Copper sulphate in swimming pools, the practical use of 110
Corneal ulceration, gonorrheal—management of 403
Correct analysis of Horlick's malted milk.. 759
Correction of depressed fracture of the nose by transplanted cartilage 142
Creolin in scabies in the infant..... 794
in the treatment of pediculosis pubis... 656
Cultures from physicians' clinical thermometers 906
Cunningham, William P.: The Heart of the Cancer Problem 542
Cyanide gas fumigation 886
Cyanocuprol in the treatment of tuberculosis 784
Cystinuria and cystin stones..... 436
Cystostomy, suprapubic—technique of in badly infected cases 813

Danger of baths in patients suffering from arteriosclerosis 799
of tetanus in operative cases..... 247
Dangerous anesthetic—nitrous oxide oxygen 782
Dangers of artificial pneumothorax..... 328
Davis, Edward P.: The General Practitioner and Obstetric Surgery 233
Deafness, catarrhal—preventive treatment of 38
due to syphilis 742
Death after nitrous-oxide-oxygen and local anesthesia 733
Deep-seated alveolar infections 286
Defects of the foot 295
Deformity in infantile paralysis, prevention and limitation of 687
Delayed gastric digestion 652
Delirium tremens and drug habitués in public institution practice 551
Depressed fracture of the nose, correction of by transplanted cartilage 142
Dermatitis, seborrheic 872
Dermatology, radium in 334
Dermatoses, chronic pyogenic—the bacterin treatment of 337
Devascularized intestine, treatment of..... 660
Diabetes mellitus and other endocrine disorders, the pituitary gland in..... 127
and pregnancy 275
the Allen treatment in....24, 335, 395
the nitrogen balance in and its importance in treatment 344
severe—exercise in the treatment of.... 120
the fasting treatment of..... 868
the treatment of..... 24
Diabetic acidosis..... 797
question, the 629
Diagnosis and treatment 772
of chronic gonorrhea... 238
of pneumonia 159
complications, and treatment of pneumonia in children..... 156
Diarrhea, acidosis occurring with..... 557
and dysentery, notes on the treatment of 412
and vomiting in children..... 703
fermentative, in infants (carbohydrate form) 487
summer—the management of..... 489
Diarsenolized serum, intraventricular injections of in the treatment of paresis..... 821
Diastolic blood measurement in diagnosis of circulatory disturbances, the value of.... 354
Diet and renal disease..... 475
in chronic heart disease..... 321
in diseases of the stomach..... 80
in the treatment of pulmonary tuberculosis 656
list for diabetes 396
Dietetic and medical treatment of cancer... 1
management of hypercholesterinemia in cases of cholelithiasis 879
Differentiation and treatment of syhilitic and tuberculous skin lesions..... 457
Digestion, delayed gastric..... 652
in infancy, treatment of the disturbances of 427
Digitalis arrhythmias, caffeine in..... 104
in cardiac cases 317
in irregularity of the heart-beat..... 267
in the treatment of auricular fibrillation 808
of heart disease 103
of high blood-pressure..... 52
preparations, rate of absorption of from the gastrointestinal tract..... 876
treatment of heart affections..... 583
Dilatation of the colon, congenital..... 590
Diphtheria and other pharyngeal and nasal conditions, results of the examination of cultures from suspected cases of... 177
antitoxin, serum sickness in patients treated with 405
carriers, the treatment of with iodized phenol 580
epidemics, the control of..... 582

Diphtheria, the newer antitoxin treatment of 22
toxin-antitoxin, active immunization with 422
Direct transfusion of blood 203
Disabilities, surgical, of troops in training 563
Discussion of acidosis 586
Diseases of the ear, nose, and throat, local treatment of 499
of the stomach, modern method of treatment of 77
Disinfection of septic joints 285
Dislocation of the phalanges, compound 532
Diuretics, stimulant, in acute nephritis 96
Doctors in England, shortage of on account of the war 150
Does the combination of quinine with aspirin produce a toxic substance? 620
Domestic flies, the production and self-destruction of in horse manure 435
Drainage in the treatment of empyema 100
Dressings used in a casualty clearing station 600
Drug habitués and delirium tremens in public institution practice 551
Drugs, available—how physicians and pharmacists can coöperate in the use of 469
Duodenal alimentation 883
and jejunal ulcers 439
ulcer 265
from a surgical standpoint 285
Duration of treatment in 1500 cases of military surgery 101
Dysentery, amebic—emetine in the treatment of 26
the treatment of 330
treatment of carriers of 730
and diarrhea, notes on the treatment of 412
bacillary—serum treatment of 495
endamebic 179
the treatment of 356
treatment of with emetine 276
Dysmenorrhea and sterility, the intrauterine stem pessary for the treatment of 514
intranasal treatment of 62
observations on the treatment of 339

Ear diseases, some phases of 609
nose and throat diseases, local treatment of 499
Early disinfection of war injuries 289
morning toxic vomiting in children 887
recognition and treatment of the common affections of the eye 257
Eclampsia, some practical points on the treatment of 381
treatment of 807
Eczema marginatum affecting the hands and feet 592
Edema and varices of the lower extremities, operative treatment of 203
Ehrlich's recent modification of salvarsan 37
Eiweissmilch, use of 867
Elbow fracture 361
Electricity in the treatment of infantile paralysis 689
Electrocardiographic studies of patients under digitalis treatment 583
Electrolysis for the removal of superfluous hair 125
Elimination of hexamethylene-tetramine (urotropin) 351
Emetine and bismuth, double iodide of in the treatment of carriers of amebic dysentery 730
and ipecac in the treatment of endamebic dysentery 179
during pregnancy and menstruation 258
hydrochloride, the toxicity of various commercial preparations of 349
in intestinal hemorrhage 590
in the treatment of amebic dysentery 330
of diarrhea and dysentery 412
of dysentery 276
of pyorrhea alveolaris 875
poisoning, chronic 419
the action of in the destruction of parasitic amebæ 26
the effect of on the free vegetative forms and cysts of entameba histolytica and entameba coli 646
the pharmacology of 879
therapy, rational—suggestions with regard to a 578
the toxicity of 348
toxicology of 329
Empyema and pulmonary abscess, the medical aspects of 269
Empyema of the thorax, recent progress in the operative treatment of 895
pneumodynamics of 271
the treatment of 100
Endamebic dysentery 179
End results in 242 cases of simple fracture of the femoral shaft 141
of a series of 300 operations on the gall-bladder 132
of bone fractures 138
of umbilical hernia 516
Enema, ammonia as an 493
Enlarged glands in the neck, the treatment of 27
Enlargement of the thymus 206
Entameba histolytica and entameba coli, the effect of emetine on the free vegetative forms and cysts of 646
Enteroptosis, abdominal supports in the treatment of 84
Enucleation of tonsils, anesthesia for 569
Enuresis, the management of 129
Epididymitis, acute—surgical treatment of 748
Epifascial method of injecting mercury and salvarsan derivatives 710
Epilepsy, bromide sedation in 764
puncture of the corpus callosum in 131
the treatment of 786
value of the bromides in the treatment of 774
Episiotomy 412
Ergot poisoning, tetany in an adult following 426
Ether and chloroform anesthesia 870
methods of administering 621
the safest general anesthetic 185
Etiology and treatment of heart disease, observations upon the 270, 347
of cancer of the stomach 736
of uterine prolapse 734
Eudrenine in minor operative surgery, the value of 795
Examination, preparation and care of surgical patients 290
Exercise in the treatment of severe diabetes 120
Exophthalmic goitre, Roentgen-ray treatment of 53
treatment of 177, 802
Experience with homogenized olive oil mixtures 793
Experiments versus clinical experience 851
Exudative diathesis in infancy, atropine treatment for the 107
Eye affections, common 408
early recognition and treatment of 257

Failure of union between the vas deferens and the testis 362
Fasting treatment of diabetes 868
Fate of patients who have had stones removed from their kidneys 900
Fat in infant feeding, the rôle of 497
transplantation 817
Favus and ringworm of the scalp, the prevention and treatment of 334
Feeding by rectum, value of 106
by the duodenum 883
of infants, artificial—simple guides for the 409
undiluted citrated milk in the 505
Female sterility, the causes and treatment of 463
Femoral fracture 478
fractures, treatment of with Hodgen's splint 897
shaft, simple fracture of the—end results in 242 cases of 141
Fermentative diarrhea in infants (carbohydrate form) 487
Fermented milk and whey in infant feeding 272
Ferry, N. S.: The Phenomenon of Anaphylaxis: Its Clinical Significance and Practical Utilization 843
Fever, the initial sign of tuberculous infection in infants 486
Fibrillation, auricular: its recognition and treatment 808
Final report of the commission on venereal diseases 518
results in twelve cases of colectomy 602
Fischelis, Robert P.: How Physicians and Pharmacists Can Coöperate in the Use of Available Drugs 469
Fistula, bismuth paste in the treatment of 597
in ano, prevention of 57
Flabby heart, massage in the treatment of 781

Flagellate diarrhea and kala-azar, methylene blue in the treatment of..... 346
dysentery, treatment of 415
Fleiner's oil in the treatment of chronic intestinal stasis 730
Flexed scapulæ, late results of surgical treatment for 58
Flexner's serum in the treatment of cerebrospinal meningitis 298
Follow-up system, the 324
Food and its value, a study on..... 654
Foot disabilities of the soldier..... 622
plates—cases in which they fail..... 398
strain and other common foot defects.. 295
Foulkrod, Collin: The Use of Pituitrin in Labor 305
Fractured bones, end results of..... 138
Fractures about the wrist in childhood and adolescence 895
fresh—the sliding graft and kangaroo suture in 820
of the femur, treatment of with Hodgen's splint 897
of the neck of the femur based upon anatomical and clinical studies..... 603
the treatment of 853
Fracture, the diagnosis of by physical examination versus skiagraphy..... 479
of the elbow 361
of the leg, results of treatment in..... 775
of the neck of the femur..... 478
of the shaft of the humerus, ununited—transplantation of bone in..... 516
Freeman, John King: Hyperthyroidosis Associated with Gynecomastia 9
Friedenwald, Julius: The Modern Method of Treatment of Diseases of the Stomach... 77
Fumigation by cyanide gas..... 886
Functional causes of sterility in women.... 466
status of amputation stumps in war... 889
Fused kidney, unilateral 448

Gall-bladder, end results of a series of 300 operations on the 132
Gall-stone diagnosis by the Roentgen ray, the present status of..... 452
disease, recurrence of symptoms after operation for 718
Galyl, a substitute for salvarsan and neosalvarsan 116
clinical results of 1000 intravenous injections of 360
Gamma rays, the action of on deep-seated inoperable cancers of the pelvis..... 646
Gangrene of the lung following artificial pneumothorax 708
Gas as a general anesthetic in surgery..... 185
Gas-oxygen anesthesia and its limitations... 870
Gas poisoning 284
Gastric and duodenal ulcer, medical treatment of 865
scarlet red in the treatment of... 785
digestion, delayed 652
disturbances, the diet in patients suffering from 81
function in pulmonary tuberculosis.... 880
juice, the action of bitter tonics on the secretion of 323
ulcer, treatment of 417
Gastritis, hydrochloric acid in the treatment of 84
Gastroenterostomy, 100 cases of as compared with 100 cases of pyloroplasty..... 139
Gastrointestinal affections, Roentgen-ray in. 53
tract of man, effect of moderate doses of on the 420
General practitioner and obstetric surgery. 233
principles in the treatment of cerebral tumors 595
Germ infection and vaccine therapy..... 169
Glandular tuberculosis 300
Glaucoma, massage in 566
the indications for operation in..... 86
Glucose solution as a prophylactic in shock. 55
Goitre, toxic—management of..... 337
Gonorrhea, asthma, and arthritis, the treatment of by phylacogens..... 808
chronic—diagnosis and treatment of.... 238
prompt cure of 433
vaccine treatment of 650
Gonorrheal ulceration of the cornea, management of 403
Gordon, Alfred: Treatment of Sciatica and Neuritis of Other Peripheral Nerves with Hot Saline Solutions 392
Gottheil, William S.: The Differentiation and Treatment of Syphilitic and Tuberculous Skin Lesions 457
Graves's disease, treatment of by the Roentgen-ray 859
Grayson, Charles Prevost: Common Affections of the Nose and Throat—Their Early Recognition and Treatment 229
Gummatous cervical adenitis 205
Gunshot injuries of joints, positions of election for ankylosis following..... 662
injury of the peripheral nerves..... 812
wounds and injuries of the spinal cord. 748
of the abdomen, treatment of..... 288
of the abdominal cavity.....370, 371
of the chest, surgical treatment of. 443
of the head 212
the treatment of by packing with salt sacs 674
Gynecology, progress in 509, 514
Gynecomastia, hyperthyroidosis associated with 9

Hallux rigidus 666
Hare, Hobart Amory: Imagination and the Profession of Medicine..... 16
The Diagnosis and Treatment of Pneumonia 159
Harrison law again 573
report on the 225
Hay-fever, sodium bicarbonate in..... 47
the treatment of 653
treatment of with pollen toxin..... 587
Headache, the ocular causes of..... 629
Heart and aorta, luetic disease of the—clinical observations on 427
beat, irregularity of the..... 267
disease, chronic—diet in..... 321
observations upon the etiology and treatment of 270, 347
the treatment of 102
of the cancer problem..... 542
perfused—researches on the 261
Heineberg, Alfred: The Causes and Treatment of Sterility in Women..... 463
Hemothorax, treatment of 28
Hemorrhage, blood-pressure and its restoration in 657
citrate transfusion for 636
clinical experiences with coagulose in cases of 243
intestinal—emetine in 590
intracranial, in the new-born, further experience in the treatment of..... 768
uterine—treatment of by the Roentgen-ray 357
Hemorrhagic disease of the new-born..... 338
Hemorrhoids and carbuncle, the phenol treatment of 380
the treatment of by injection..... 637
Hepatic failure in yellow fever, malaria, and other conditions—treatment..... 713
Hereditary syphilis, the infantile type of . 492
Heredity, the influence of alcohol upon.... 771
Hernias of the urinary bladder..... 893
Hernia, umbilical—end results of..... 516
Herniotomy, local anesthesia in..... 147
Hexamethylene-tetramine (urotropin), the elimination of 351
Hexamine: its use and misuse..... 576
High blood-pressure, treatment of..... 51
frequency current in the treatment of tumors of the bladder 137
intestinal stasis 565
Hip fractures, the application of a plaster cast for 855
Histologic changes in arsenic kidneys..... 201
Historical statement of the institution of the cold fresh air treatment of pneumonia.... 153
Hodgen's splint in the treatment of fractures of the femur..... 897
Homogenized olive oil mixtures, experience with 793
Horlick's malted milk, correct analysis of 759
Hormones and vaccines..... 50
Hospital treatment, the follow-up treatment in 324
Hot saline solutions in the treatment of sciatica and neuritis 392
How does emetine act in the destruction of parasitic amebæ? 26
physicians and pharmacists can coöperate in the use of available drugs... 469
Hydrotherapy in the treatment of infantile paralysis 689
Hypercholesterinemia, dietetic management of in cases of cholelithiasis 879
Hyperthyroidism 405
Hyperthyroidosis associated with gynecomastia 9
Hypertonic permanganate treatment of cholera, addition of atropine to the..... 429

Hypodermic injections of morphine causing blood tattooing of the skin 176
of oxygen gas in therapeutics 35
Hypothyroidism 407
with report of cases..... 533

Ichthyol and glycerin in the treatment of septic wounds 301
Imagination and the profession of medicine. 16
Immunized milk as a preventive and cure in tuberculosis 245
Immunizing nurses and hospital attaches against typhoid fever 45
Improved substitute for iodized catgut sutures 299
Incontinence of urine, the management of.. 129
Indications for and results of cerebral and cerebellar decompression in acute and chronic brain disease..... 825
for blood transfusion 483
for operation in glaucoma..... 86
Indigestion, carbohydrate 422
Induction of labor in normal pelvis at term. 434
Industrial aniline poisoning..... 789
Inevitable and incomplete abortion, the use of pituitrin in 119
Infancy and childhood, acid autointoxication in 572
Infant feeding, artificial—simple guides for. 409
whole milk in..... 121
casein-milk in..... 113
chemistry of cow's milk and other products used in..... 489
citrated milk for 654
fermented milk and whey in..... 272
the rôle of fat in..... 497
the rôle of salt in..... 498
the soy-bean and condensed milk in 108
undiluted citrated milk in..... 505
Infantile asthma, treatment of..... 52
beriberi, treatment of..... 340
diarrhea, fermentative (carbohydrate form) 487
digestion, treatment of the disturbances of 427
otitis media 181
paralysis.....556, 562, 639, 641, 643, 644, 645, 687, 704, 725, 727, 783
deformity in—prevention and limitation of 687
means of prevention of..... 643
the necessity for prolonged treatment in cases of..... 783
the treatment of by adrenalin... 641
pyloric obstruction 570
type of hereditary syphilis, observations on 100 cases of the..... 492
Infected wounds, treatment of..... 823
of by physiological methods 818
Infectious diseases, acute and chronic—the relation of hypothyroidism to..... 533
Infectiousness of the cerebrospinal fluid in syphilis 677
Infiltration anesthesia 761
Influence of salicylate on metabolism in man 652
Influenza, aural complications of..... 165
Injection treatment of hemorrhoids..... 637
Injuries of the spinal cord from gunshot wounds 748
to the ankle 326
Inoperable cancers of the pelvis, deep-seated —the action of gamma rays on..... 646
Inorganic chemicals, the situation regarding 471
Intestinal drainage and septic peritonitis.. 98
hemorrhage, emetine in..... 590
paralysis and its treatment by pituitrin 702
stasis, chronic, from the view-point of the internist 730
and intestinal intoxications..... 191
high 565
Intoxication by cannabis indica, two cases of 554
Intracranial bleeding in the new-born, the diagnosis of 358
hemorrhage in the new-born, further experience in the treatment of..... 768
injection of salvarsanized serum..... 635
telangiectasis: symptomatology and treatment 134
Intractable pruritus ani, treatment of by local anesthetic methods..... 568
Intradural nerve anastomosis in selected cases of poliomyelitic paralysis..... 815
Intramine in the treatment of syphilis..... 438
Intramuscular injections of mercury salicylate in the treatment of syphilis..... 582
Intranasal treatment of dysmenorrhea..... 62
Intraspinal injections of bichloride of mercury 708
treatment of syphilis of the central nervous system, according to the method of Swift and Ellis 406
with especial reference to the spinal fluid findings 116
Intraspinous treatment of syphilis by salvarsanized serum 815
of tetanus with large dosis of antitoxin..... 293
Intravenous administration of mercury in syphilis 634
medication, the technique of..... 691
saline in cholera—a contraindication... 651
Iodide of silver in ocular therapeutics..... 179
Iodine, tincture of, for ringworm..... 836
Iodized phenol, the treatment of diphtheria carriers with 580
Iodoform and bismuth in the treatment of perforated wounds 755
Ipecac and emetine in the treatment of endamebic dysentery 179
Iritis, treatment of 188
Irregularity of the heart beat..... 267
Ivy poisoning, a simple treatment for..... 54

Jaundice, chronic obstructive—the relief of by palliative operation..... 628
Jejunal and duodenal ulcers..... 439
Joint injuries, gunshot—positions of election for ankylosis following.... 662
massage in the treatment of..... 781
suppuration and wounds, the treatment of 65
tuberculosis, as to the necessity of..... 604
Joints, septic—disinfection of..... 285

Kala-azar, the treatment of with tartar emetic 328
Kangaroo suture for sliding grafts in fresh fractures 820
Karell cure in the treatment of cardiac, renal, and hepatic dropsies... 647
Kharsivan and galyl in the treatment of syphilis 520
Kidney, perfused—urine formation by the.. 128
stones—fate of patients who have had them removed 900
tumor, malignant 300
unilateral fused 448
Kidneys, arsenical lesions of—histological changes in 201
Kitchens, Neal: Bromoform in Whooping-cough 842
Knee-joint, treatment of unstable semilunar cartilages of the..... 787

Labor, anesthesia in..... 388
a practical method of minimizing the pain of 733
chloroform in 878
extract of pituitary gland in..... 277
induction of in normal pelves at term.. 434
painless 882
rectal as a substitute for vaginal examinations in 416
the use of pituitrin in..... 305
the use of scopolamine-morphine in.... 47
Lachrymal drainage apparatus, conservative treatment of the affections of the..... 612
Lactic acid bacillus, value of the..... 97
Larned, Ezra Read: The Technique of Intravenous Medication 691
Late results of splenectomy in pernicious anemia 880
of surgical treatment for flexed scapulæ 58
Lead acetate as a drug and poison..... 248
LeComte, R. M.: The Application of Bacterial Vaccines in Treatment..... 615
Leeches, the use of in heart disease..... 102
Leg fracture, results of treatment in..... 775
Lice and other body vermin, best methods of destroying 708
Limitations of gas-oxygen anesthesia..... 870
of local anesthetics in anorectal surgery, conclusions regarding the 213
Lethal dose of strophanthin in animals, action of 261
Lobar pneumonia—symptoms of onset..... 158
Local and general anesthetics, the combination of and the use of adrenalin..... 421
anesthesia in herniotomy 147
anesthetic, eudrenine as a..... 795

Local anesthetic, quinine and urea hydrochloride as a..... 114
spinal anesthesia 677
treatment of diseases of the ear, nose, and throat 499
London letter....75, 150, 223, 303, 378, 455, 530, 606, 682, 755, 834, 910
School of Medicine for Women, extension of the..... 911
Louse as an army pest..... 624
Luetic disease of the heart and aorta, clinical observations on 427
Luetin reaction, effect of potassium iodide on the 881
Luteum extract in the treatment of menstrual disorders 168

Magnesium sulphate in the treatment of tetanus, the present status of 728
lotion in cellulitis..... 571
Malarial infections, value of quinine and its congeners in 423
Malaria, specific treatment of malignant forms of 46
yellow fever, and other conditions, the treatment of hepatic failure in..... 713
Male pollutions 372
Malignant disease of the uterus, newer methods of treatment for the patient with 44
Malunited and ununited fractures..... 667
Management of gonorrheal ulceration of the cornea 403
of placenta previa..... 187
of summer diarrhea..... 489
of toxic goitre..... 337
Manual methods of artificial respiration for asphyxia 849
Martin, Edward: Spyhilis from the Standpoint of the Surgeon..... 685
Massage in glaucoma..... 566
of the heart in the treatment of sudden cardiac arrest 23
some of the uses and abuses of..... 780
Mastitis, chronic, and carcinoma of the breast, the relation between..... 665
McDonald's solution, advantages of as an antiseptic 863
Means of prevention of infantile paralysis.. 643
Measles, an epidemic of in England..... 223
the quarantine period for..... 864
Medical and dietetic treatment of cancer.. 1
aspect of cholecystitis and cholangitis, observations on the..... 765
aspects of empyema and pulmonary abscess 269
inspection of schoolchildren in England. 834
practitioner, status of the under the Harrison law 574
profession of England and the war.... 303
organization of in England..... 224
research committee in England, work being done under the auspices of the. 224
treatment of gastric and duodenal ulcer. 865
Medicine, some physical facts about the radioactive elements as applied in.... 87
the profession of, and imagination.... 16
the weasel in 760
Megacolon, true 590
Meningitis, cerebrospinal 297
prospects of surgical treatment in..... 904
Menstrual disorders, luteum extract in the treatment of 168
Menstruation and pregnancy, emetine during 258
Mercurialized serum in the treatment of cerebrospinal syphilis 192
Mercurial poisoning, a note on..... 97
Mercuric chloride poisoning and its treatment 281
antidotes in 481
Mercury and salvarsan derivatives, the epifascial method of injecting 710
in the treatment of congenital syphilis ... 373
of syphilis.723, 881
elimination in bichloride poisoning..... 407
in syphilis, the intravenous administration of 634
salicylate, intramuscular injections of in the treatment of syphilis..... 582
Metabolism and treatment of rheumatoid arthritis 485
in man, the influence of salicylate on.. 652
Methods of administering ether..... 621
Mercury injections, deep muscular, in the treatment of pyorrhea alveolaris and its secondary systemic infections..... 631
Methylene blue in the treatment of "flagellate-diarrhea" and of kala-azar..... 346
Meyers, Sidney J.: Prevention of Typhoid Fever by Vaccination..... 90
Midwife problem 281
Migraine, treatment of..... 580
Military surgery, the duration of treatment in 1500 cases of..... 101
Milk feeding for infants, citrated..... 654
Miller, J. W.: Diagnosis and Treatment of Chronic Gonorrhea 238
Mills, H. Brooker: Diagnosis, Complications, and Treatment of Pneumonia in Children. 156
Mind and the body in surgical operations.. 850
Mineral water in the treatment of gastric disorders 84
Minor operative surgery, the value of eudrenine in 795
Mixed vaccines containing bacillus typhosus, bacillus paratyphosus A, and bacillus paratyphosis B, with regard to the reaction produced and the antibody formation.... 720
treatment with 333
Modern method of treatment of diseases of the stomach 77
theories of pasteurization..... 352
treatment with 333
Morestin treatment of peritonitis, some experimental data on the..... 141
Morphine and morphine-narcotin (narcophin), the comparative toxicity of.. 868
and scopolamine action upon the intact uterus 124
amnesia in obstetrics 49
and strychnine action, the similarity and synergy of..... 175
or opium addition, treatment of..... 258
relation to postoperative complications and immunity 355
Mouth tumors 362
Mucous colitis and its treatment.....199, 801
Muscle training in the treatment of infantile paralysis 689
Muscular rheumatism, the treatment of.... 716

Narcotics and alcohol..... 769
Nassau, Charles F.: Infiltration Anesthesia.. 761
Necessity for prolonged treatment in cases of infantile paralysis..... 783
Needless surgical operations from failure to recognize tabes dorsalis..... 498
Neisserian proctorrhea 374
Neosalvarsan injections, the influence of on the arterial blood-pressure..... 105
in the treatment of the infantile type of hereditary syphilis 492
Nephrectomy, complications in connection with the ureteral stump after..... 288
Nephritis, acute—stimulant diuretics in.... 96
and Bright's disease, the choice of climate in 687
the problems of from the clinical standpoint 273, 348
the treatment of.....411, 475
Nervous syphilis, treatment of..... 111
Neuritis and sciatica, treatment with hot saline solutions 392
Nevus flammeus and allied conditions, the treatment of by filtered ultra-violet rays. 812
New-born, diagnosis of intracranial bleeding in the 858
hemorrhagic disease of the..... 338
intracranial hemorrhage in the—further experience in treatment of 768
Newcomet, William S.: Some Physical Facts about the Radioactive Elements as Applied in Medicine..... 87
Newer antitoxin treatment of diphtheria... 22
methods of treatment for the patient with malignant disease of the uterus. 44
New operation for the relief of pruritus ani. 211
Nicholson, William R.: Anesthesia in Labor. 388
Nitrogen balance in diabetes mellitus and its importance in treatment..... 344
Nitrous oxide as a general anesthetic and analgesic 584
in obstetrics 432, 715
oxygen analgesia in obstetrics.112, 502
and local anesthesia, death after 733
the most dangerous anesthetic 782
Nonne and Froin spinal fluid syndromes and their diagnostic significance..... 890
Non-poisonous antiseptic, a trustworthy.... 805
Non-tuberculous infections of the respiratory tract, with special reference to sputum cultures as a means of diagnosis..... 190

Normal and infected sera, the bactericidal action of upon different microbes..... 356
Northrup, W. P.: Historical Statement of the Institution of the Cold Fresh Air Treatment of Pneumonia..... 153
Nose and throat affections, common—their early recognition and treatment..... 229
Notification of venereal disease in Sweden.. 602
Novel method of using adrenalin in resuscitation 701
Nutrition and development, the pituitary body and its effects upon..... 397
Nutritive value of boiled milk..... 418

Observations on the intranasal treatment of dysmenorrhea 62
on the medical aspect of cholecystitis and cholangitis 765
on the treatment of anaphylaxis..... 648
of dysmenorrhea 339
on the use of pituitary extract..... 197
Obstetrical practice, pituitary extract in.... 885
Obstetric cases, pituitary extract in..... 48
surgery and the general practitioner... 233
Obstetrics, morphine and scopolamine amnesia in..... 49
nitrous oxide in.....432, 715
oxygen analgesia in....112, 502
pituitary extract in.....115, 482, 852
twilight sleep in—the present status of, based on a collection study of over 2000 cases 126
uses and limitations of pituitrin in..... 494
Obstruction of the pylorus in infants..... 570
Obstructive jaundice, chronic—the relief of by palliative operation..... 628
Occiput posterior 657
Occupational diseases, control of the..... 58
Ocular causes of headache..... 629
therapeutics, iodide of silver in..... 179
Old popular mixtures, the passing of..... 701
Olive oil mixtures, homogenized—experience with 793
Operative treatment of edema and varices of the lower extremities..... 203
of varicose veins and ulcers. 250
Opium alkaloids, action of the individually and in combination on the respiration 190
a quantitative study of the analgesia produced by in normal man 351
peripheral action of the—effect on sensory nerve terminals... 873
and peritonitis 619
derivatives, effect of moderate doses of on the gastrointestinal tract of man.. 420
or morphine addiction, treatment of.... 258
Optochin and quinine, the comparative pharmacologic action of..... 351
Organic chemicals, the situation regarding. 472
Organs of reproduction, diseases of the—relation of hypothyroidism to..... 534
Osteomyelitis, alveolar (pyorrhea alveolaris), treatment of with vaccines..... 875
Otitis media, acute..... 93
in infancy 181
chronic suppurative—vaccine treatment of 722
Outline for the management of cardiac cases from the out-patient department standpoint 317
Ovarian transplantation 283
Oxygen gas, hypodermic injections of in therapeutics 35

Painless labor 882
Pancreas stone colic..... 204
Paralysis agitans, the treatment of with parathyroid gland 795
during Pasteur antirabic treatment..... 659
following acute anterior poliomyelitis, treatment of the..... 562
infantile—prevention and limitation of deformity in 687
the treatment of by adrenalin..... 641
intestinal, and its treatment by pituitrin 702
Paralyzed muscles, massage in the treatment of 780
Paranephritic abscess 61
Parasitic amebæ, how does emetine act in the destruction of?..... 26
Paratyphoid gland in the treatment of paralysis agitans 795
Paresis and tabes dorsalis, the treatment of by salvarsanized serum..... 350
the treatment of..... 643
of by intraventricular injections of diarsenolized serum..... 821
Passing of old popular mixtures..... 701
Pasteur antirabic treatment, paralysis during 659
Pasteurization, modern theories of..... 352
Pediatrics, the proper position of tonsillectomy in 339
Pediculosis pubis..... 655
Pellagra, treatment of..... 488
Pelvic fracture, a sign of..... 508
varicocele 63
Penetrating wounds of the abdomen..... 679
treated just behind the battle line 144
Pepsin in the treatment of gastric disorders 84
Perforating and penetrating wounds of the chest with severe hemorrhage..... 746
wounds of the abdomen.....370, 371
Perforation in typhoid fever..... 627
Perfused heart, researches on the..... 261
kidney, urine formation by the..... 128
Pericarditis, suppurative 367
Peripheral action of the opium alkaloids—effect on sensory nerve terminals.... 873
nerves, gunshot injury of the..... 812
vasomotor manifestations in shock.... 207
Peritoneal adhesions, prevention of..... 68
of by the use of citrate solutions 433
Peritoneal infections, the antiseptic action of ether in..... 570
Peritonitis, septic, and intestinal drainage.. 98
some experimental data on the Morestin treatment of..... 141
treatment of with opium..... 619
Peritonsillar abscess, radical treatment of.. 293
Pernicious anemia, late results of splenectomy in 880
Personal equation, importance of in the treatment of the tuberculous..... 118
Phalangeal dislocation, compound..... 532
Pharmacology of emetine..... 879
Phenol, iodized—the treatment of diphtheria carriers with..... 580
treatment of carbuncle and hemorrhoids 380
Phenolphthalein, 1000 doses of..... 270
Phenomenon of anaphylaxis: its clinical significance and practical utilization..... 843
Phthalein function test in nephritis..... 273
Phylacogens in the treatment of asthma, arthritis and gonorrhea..... 808
Phylacogen therapy, observations in by a general practitioner 633
Physical examination versus skiagraphy, the diagnosis of fracture by..... 479
facts about the radioactive elements as applied in medicine..... 87
properties and physiological action of the ultra-violet rays..... 312
Physicians and pharmacists—how they can coöperate in the use of available drugs.. 469
Physicians' clinical thermometers, cultures from 906
Physics of a surgical dressing..... 507
Physiological methods in the treatment of infected wounds 818
Physiology of the pituitary gland and the actions of its extracts..... 411
Picric acid in the treatment of burns..... 57
Pituitary body and its effects upon nutrition and development 397
extract: a note of warning regarding its use 255
in obstetrics.....48, 482, 852, 885
observations on the use of..... 197
the abuse of 483
gland—does it contain adrenalin or a compound similar to it?..... 352
extract of, in labor..... 277
in diabetes mellitus and other endocrine disorders 127
physiology of and the actions of its extracts 411
Pituitrin extract in obstetrics..... 115
in inevitable and incomplete abortion.. 119
in labor, the use of..... 305
in surgery 278
in the treatment of intestinal paralysis. 702
in the tropics 256
uses and limitations of in obstetrical practice 494
Placenta previa, the management of..... 187
the treatment of by abdominal section 237
Plastic drainage of ascites..... 131
Plea for a collective study of tetanus..... 599
Pleural effusion, various methods of treating 171
Pneumodynamics of empyema 271

Pneumonia, a review of postoperative cases of ... 664
cold fresh air treatment of—historical statement of the institution of the... 153
in children, diagnosis, complications, and treatment of ... 156
the diagnosis and treatment of... 159
Pneumothorax, artificial—gangrene of the lung following ... 708
in the treatment of pulmonary tuberculosis. 43, 275
in tuberculosis... 175
the dangers of... 328
puncture ... 594
treatment of pulmonary tubercle, contraindications in the ... 790
Poisoning, bichloride—chemical studies on a case of ... 861
by aniline, industrial... 789
by bichloride, mercury elimination in.. 407
by bichloride of mercury... 97
by carbon monoxide ... 877
by emetine, chronic ... 419
by gas ... 284
by ivy, a simple treatment for... 54
by mercuric chloride and its treatment. 281
antidotes in ... 481
by salvarsan ... 247
from ergot, tetany in an adult following 426
Poisonous drugs, shipment of by mail... 759
Poliomyelitic paralysis, intradural nerve anastomosis in selected cases of... 815
Poliomyelitis...556, 562, 639, 641, 643, 644, 645, 687, 704, 725, 727, 783
acute anterior—the treatment of in the preparalytic and postparalytic stages ... 639
treatment of the paralysis following ... 562
treatment of ... 503
adrenalin in ...645, 727
anterior—treatment of ... 725
treatment of the acute stage of.... 644
the value of adrenalin in... 704
treatment of ... 556
Pollen toxin in the treatment of hay-fever. 587
vaccine in the treatment of hay-fever.. 653
Pollutions in the male... 372
Popular mixtures, old—the passing of... 701
Posey, William Campbell: The Indications for Operation in Glaucoma... 86
Positions of election for ankylosis following gunshot injuries of joints... 662
Posterior urethritis, chronic ... 239
Postoperative cases of pneumonia, a review of ... 664
complications and immunity, the relation of morphine to ... 355
renal infection ... 66
tetanus ... 522
Potassium iodide, effect of on the luetin reaction ... 881
Practical method of minimizing the pain of labor ... 733
points on the treatment of eclampsia, with report of illustrative cases.... 381
Pregnancy and diabetes mellitus... 275
and menstruation, emetine during... 258
acute pyelitis of ... 104
in the tuberculous ... 745
pyelitis of ... 891
toxemia ... 794
treatment of toxemia of... 577
Prescriptions for the treatment of alopecia. 346
Present status of gall-stone diagnosis by the Roentgen-ray ... 452
of magnesium sulphate in the treatment of tetanus... 728
Prevalence of syphilis... 308
Prevention and limitation of deformity in infantile paralysis ... 687
of fistula in ano ... 57
of peritoneal adhesions ... 68
by the use of citrate solutions ... 433
of relapse after emetine... 276
of typhoid fever by vaccination... 90
of venereal diseases in the army... 737
Preventive treatment of catarrhal deafness. 38
Primary carcinoma of the urethra, retention of urine from obstruction, restoration of function by radium... 822
syphilis, salvarsan in ... 416
treatment of wounds in civil practice.. 889
Problem of ringworm in children... 721
of tuberculous infection in children.... 720
Problems of nephritis from the clinical standpoint ...273, 348
Proctorrhea, Neisserian ... 374
Production and self-destruction of domestic flies in horse manure ... 435
Prognosis of urethral stricture... 400
Progress in gynecology...509, 514
Prolapse of the uterus, etiology of... 734
Prolonged feeding of aluminum salts, the effects of ... 406
Prompt cure of gonorrhea... 433
Proper position of tonsillectomy in pediatrics ... 339
Prophylactic use of tetanus antitoxin... 434
Prophylaxis of tetanus... 173
Prospects of surgical treatment in meningitis ... 904
Protein milk, the composition and preparation of ... 43
Pruritus ani, a treatment of... 731
intractable—treatment of by local anesthetic methods ... 568
new operation for the relief of... 211
treatment of ... 41
Pseudocoxalgia ... 202
Psychic causes of sterility in women... 467
Puerperium, care of the... 262
Pulmonary abscess and empyema, the medical aspects of ... 269
and cardiac disease, associated... 95
tubercle, contraindications in the pneumothorax treatment of ... 790
tuberculosis, artificial pneumothorax in the treatment of ...43, 275
climate in the treatment of... 618
diet in the treatment of... 656
gastric function in ... 880
Pulse pressure as a measure of circulatory efficiency ... 869
Puncture of the corpus callosum in epilepsy. 131
Pyelitis, acute, of pregnancy... 104
its clinical significance... 282
of pregnancy ... 891
Pyloric exclusion ... 517
obstruction in infants ... 570
Pyloroplasty, 100 cases of compared with 100 cases of gastroenterostomy... 139
Pyogenic dermatoses, chronic—the bacterin treatment of ... 337
Pyorrhea alveolaris ... 888
and its secondary systemic infections, the treatment of by deep muscular injections of mercury ... 631
its complications and its treatment with emetine.... 875

Quantitive study of the analgesia produced by opium alkaloids in normal man... 351
Quarantine period for measles... 864
Quinine and aspirin—does the combination produce a toxic substance?... 620
and its congeners, the therapeutic value of ... 423
and optochin, the comparative pharmacologic action of ... 351
and urea hydrochloride, the advantages of as a local anesthetic... 114
in the treatment of exophthalmic goitre ... 802
the double salt of as a local anesthetic ... 568
a specific in malaria... 46

Radical treatment of peritonsillar abscess... 293
of rheumatoid arthritis... 401
Radioactive elements, some physical facts about as applied in medicine... 87
Radium, a consideration of... 450
in dermatology ... 334
in the treatment of cancer of the uterus. 510
of carcinomas of the cervix uteri and vagina ... 265
radiology, and electrotherapeutics, recent work in ... 370
the action of on cancers of the pelvic organs ... 268
treatment at the Royal Infirmary, Edinburgh, during the year 1915—a report. 604
Randall, Alexander: The Relation of Bladder Tumors to the Cancer Problem... 242
Rapidity with which alcohol and some sugars may serve as nutriment... 863
Rational emetine therapy, suggestions with regard to a ... 578
Reamputations ... 810
Recent progress in our knowledge of the physiological action of atmospheric conditions ... 800
in the operative treatment of empyema of the thorax... 895

Recent work in radium, radiology, and electrotherapeutics 370
Rectal anesthesia in thyroidectomy..... 278
as a substitute for vaginal examination in labor 416
feeding, value of 106
Recurrence of symptoms after operation for gall-stone disease 718
Regulation of the blood volume after injections of saline solutions..... 848
Relation between chronic mastitis and carcinoma of the breast..... 665
of bladder tumors to the cancer problem 242
Removing the tonsils 647
Renal and ureteral calculus..... 513
conditions, the significance of vesical symptomatology in 399
disease and diet 475
infection, postoperative 66
pelvis, some studies on the anatomy of the 823
Renorenal reflex pain 524
Researches on the perfused heart..... 261
Respiration, action of the opium alkaloids on individually and in combination..... 190
Respiratory tract, non-tuberculous infections of the 190
Response of the surviving uterus to morphine and scopolamine 124
Results of treatment in fracture of the leg. 775
Resuscitation, a novel method of using adrenalin in 701
by cardiac massage, a case of..... 447
in various forms of asphyxia..... 849
Retrocecal appendix, the treatment of..... 743
Rheumatism and sulphur..... 416
muscular—the treatment of..... 716
treatment of 195
Rheumatoid arthritis, radical treatment of.. 401
the metabolism and treatment of 485
Ringworm in children, the problem of..... 721
and favus of the scalp, the prevention and treatment of 334
of the hands and feet 592
treated with tincture of iodine..... 836
Risley, S. D.: The Conservative Treatment of the Affections of the Lachrymal Drainage Apparatus 612
Rodent ulcers, the beneficial action of radium in 604
Roentgen irradiation in the treatment of enlarged thymus 206
Roentgen-ray diagnosis of gall-stones, the present status of 452
in gastrointestinal affections..... 53
in the treatment of uterine hemorrhage. 357
treatment of exophthalmic goitre..... 53
in the treatment of Graves's disease.... 859
of tuberculous adenitis..... 717
Rubber gloves 512
Rugh, J. Torrance: Sacroiliac Relaxation or Separation 837

Sacriliac relaxation or separation..... 837
Salicylates, the influence of on the elimination of uric acid and other waste products from the blood 191
Salicylate, the influence of on metabolism in man 652
Salicylic acid in the treatment of rheumatism 195
Salicyl in blood and joint fluid of individuals receiving full therapeutic doses of salicylate 406
Saline solutions, injections of in the regulation of the blood volume..... 848
treatment of wounds in war..... 442
Salt in infant feeding, the rôle of..... 498
Salvarsan and autosalvarsanized serum in treatment of syphilis of the central nervous system 497
and mercury in the treatment of syphilis 279
and neosalvarsan substituted by galyl.. 116
the secretion and excretion of. 659
apparatus 418
Ehrlich's recent modification of..... 37
in primary syphilis..... 416
in the treatment of cardiac syphilis..... 632
of paresis 643
of syhilis in the army..... 734
or neosalvarsan, the bacterial power acquired by the serum after the administration of 350
poisoning 247
therapy, second thoughts about..... 804
the toxicology of 571
Salvarsanized serum in the treatment of paresis and tabes dorsalis 350
in the treatment of syphilis 815
the intracranial injection of 635
Scabies in the infant, creolin in..... 794
Scarlet red in the treatment of gastric and duodenal ulcer 785
Sciatica and neuritis of other peripheral nerves, treatment with hot saline solutions 392
Scopolamine-morphine, the use of in labor.. 47
Seborrheic dermatitis 872
Second thoughts about salvarsan therapy... 804
Secretion and excretion of salvarsan and neosalvarsan 659
Septic joints, disinfection of..... 285
peritonitis and intestinal drainage..... 98
wounds, sodium hypochlorite in the treatment of 507
treatment of with equal parts of ichthyol and glycerin..... 301
Serum sickness in a series of 500 patients treated with diphtheria antitoxin.... 405
treatment of bacillary dysentery..... 495
Shanahan, William J.: Bromide Sedation in Epilepsy 764
Shipment of poisonous drugs by mail..... 759
Shock, glucose solution as a prophylactic in. 55
peripheral vasomotor manifestations in. 207
Shockless surgery 597
Significance of the amino-acids..... 791
of vesical symptomatology in renal conditions 399
Sign of fracture of the pelvis..... 508
Similarity and synergy of morphine and strychnine action 175
Simple treatment for ivy poisoning..... 54
Skiagraphy versus physical examination, the diagnosis of fracture by..... 479
Skin diseases, autoserum injections in..... 646
Sliding graft and the kangaroo suture in fresh fractures 820
Smallpox and vaccination, the truth about.. 485
the how and why of vaccination against. 54
Smith, S. MacCuen: Aural Complications of Influenza 165
Some Phases of Aural Disease..... 609
Sodium bicarbonate in hay-fever..... 47
hypochlorite in the treatment of septic wounds 507
Soldier's foot and the treatment of disabilities 622
Soy-bean and condensed milk in infant feeding 108
Sparteine sulphate based on use in 305 cases. 39
Spears, L. P.: Delirium Tremens and Drug Habitués in Public Institution Practice... 551
Specific treatment of malignant forms of malaria 46
Spinal anesthesia 810
and its use in the Trendelenburg position 806
Barker's method of..... 425
local 677
cord injuries from gunshot wounds..... 748
fluid in syphilis and its relation to treatment 182
syndromes of Nonne and Froin and their diagnostic significance..... 890
Spiral fracture of the humerus, Borchgrevink's extension splint for..... 900
Spirocheta pallida, a chemical aid in securing from syphilitic lesions 334
Splenectomy in pernicious anemia, late results of 880
technique of 740
Sputum cultures in the diagnosis of pulmonary affections 190
Stasis in the large intestine..... 565
Status of vaccine treatment..... 559
Stauffer, Nathan P.: Tonsillitis: Its Sequelæ and its Treatment 840
Stem pessary, intrauterine, for the treatment of dysmenorrhea and sterility..... 514
Sterility, anastomosis of the vasa epididymis in 204
in women, the causes and treatment of. 463
Stimulant diruetics in acute nephritis..... 96
Stock vaccine in infection by the bacillus typhosus 506
Stomach diseases, modern method of treatment of 77
operations, technique and management of 903
Stovaine in spinal anesthesia..... 810

Strophanthin, action of lethal dose of in animals 261
Study on food and its fuel value..... 654
Subacromial bursitis 515
Sudden cardiac arrest during operative procedures, the treatment of 23
Sulphur in the treatment of rheumatism... 416
Summer diarrhea, the management of..... 489
Superfluous hair, the removal of by electrolysis 125
Suppurative otitis media, vaccine treatment of 722
pericarditis 367
Suprapubic cystostomy in badly infected cases, technique of 813
Surgery of the palate..... 146
of the thyroid gland..... 855
pituitrin in 278
Surgical anatomy of cleft palate..... 135
disabilities of troops in training..... 563
dressing, the physics of a 507
intervention, what stomach symptoms justify 345
lessons of the war..... 626
operations, the mind and the body in... 850
patients, the examination, preparation, and care of 290
treatment of acute epididymitis..... 748
of gunshot wounds of the chest.... 443
Swift-Ellis method of treatment of syphilis of the central nervous system..... 406
Swimming pools, the practical use of copper sulphate in 110
Syphilis as a cause of deafness..... 742
cardiac—the treatment of 632
cerebral—salvarsan treatment of..... 897
cerebrospinal—treatment of by mercurialized serum 192
congenital—treatment of..... 373
from the standpoint of the surgeon..... 685
hereditary—the infantile type of..... 492
infectiousness of the cerebrospinal fluid in 677
in the army, treatment of..... 734
in the primary stage, treatment of..... 278
intramuscular injections of mercury salicylate in the treatment of..... 582
intraspinal injections of bichloride of mercury in 708
treatment in, with especial reference to the spinal fluid findings..... 116
intraspinous treatment of by salvarsanized serum 815
nervous—treatment of 111
of the brain, treatment of..... 111
of the central nervous system, salvarsan and autosalvarsanized serum in treatment of 497
the intraspinal treatment of 406
treatment of. 891
primary—salvarsan in 416
the intravenous administration of mercury in 634
the occurrence of in the University of Michigan obstetric and gynecologic clinic 906
the prevalence of..... 308
the rationale of chemotherapy in..... 437
the spinal fluid in and its relation to treatment 182
the treatment of.....319, 881
treatment of during the first six months after infection..... 723
we see but do not recognize..... 206
Syphilitic and tuberculous skin lesions, the differentiation and treatment of..... 457

Tabes dorsalis and paresis, the treatment of by salvarsanized serum..... 350
needless surgical operations from failure to recognize..... 498
Tapeworm, wandering..... 757
Tarsal massage in trachoma..... 274
Tartar emetic in the treatment of kala-azar 328
Technique and management of operations on the stomach..... 903
of intravenous medication..... 691
of splenectomy..... 740
of suprapubic cystostomy in badly infected cases..... 813
Telangiectasis, intracranial: symptomatology and treatment..... 134
Tendon transplantation 746
Testis, undescended—operation for..... 901
Tetanus antitoxin, the prophylactic use of.. 634
a plea for a collective study of..... 599
in operative cases, the danger of..... 247
intraspinous treatment of with large doses of antitoxin..... 293
postoperative 522
prophylaxis of..... 173
report of a case of treated by tetanus antitoxin 6
the present status of magnesium sulphate in the treatment of..... 728
treated in home military hospitals, analysis of cases of..... 209
Tetany in an adult following poisoning from ergot 426
Therapeutics, hypodermic injections of oxygen gas in..... 35
of cancer..... 431
Therapeutic possibilities of antitetanus serum 711
value of quinine and its congeners..... 423
Therapy—what it means..... 641
Thorium, the therapeutic uses of..... 89
Thymus death..... 828
enlargement 206
Thyroidectomy, rectal anesthesia in..... 278
Thyroid gland surgery..... 855
Tincture of iodine, the abuse of..... 722
Tiqui-tiqui in the treatment of infantile beriberi 340
Tonsil enucleation, anesthesia for..... 569
Tonsillectomy in pediatrics, the proper position of..... 339
Tonsillitis: its sequelæ and its treatment... 840
Tonsils and chronic cervical adenitis..... 58
conservative treatment of the..... 583
removing the..... 647
Toxemia of pregnancy.....577, 794
Toxic goitre, management of..... 337
vomiting in children, early morning.... 887
Toxicity of emetine..... 348
of various commercial preparations of emetine hydrochloride 349
Toxicology of emetine..... 329
of salvarsan..... 571
Trachoma, tarsal massage in..... 274
Transfusion of blood..... 589
direct 203
in children, the citrate method of..... 266
indications for 483
Transplantation of bone in ununited fracture of the shaft of the humerus..... 516
of free flaps of fat..... 817
of ovaries..... 283
of tendon 746
Transplanted cartilage for correction of depressed fracture of the nose..... 142
Trench feet..... 735
a number of cases of..... 75
cause and prevention of..... 738
Trendelenburg position, use of the in spinal anesthesia 806
Troops in training, surgical disabilities of.. 563
True position of adrenalin.....173, 183
Trustworthy non-poisonous antiseptic..... 805
Truth about smallpox and vaccination..... 485
Tubal sterilization..... 792
Tubercular infection of the skin, five clinical forms of..... 458
Tuberculosis and pregnancy..... 745
artificial pneumothorax in 175
chemotherapy of..... 785
glandular 300
immunized milk as a preventive and cure in..... 245
joint—as to the necessity of..... 604
of the cervical lymphatics..... 874
pulmonary—artificial pneumothorax in the treatment of 43, 275
climate in the treatment of..... 618
contraindications in the pneumothorax treatment of 790
diet in the treatment of..... 656
gastric function in 880
the treatment of with cyanocuprol..... 784
Tuberculous adenitis, the treatment of by Roentgen rays 717
and syphilitic skin lesions, the differentiation and treatment of..... 457
importance of the personal equation in the treatment of the..... 118
infection in children, the problem of... 720
in infants, fever the initial sign of.. 486
Tumor of the brain..... 777
of the kidney, malignant..... 300
Tumors, cerebral—general principles in the treatment of..... 595
of the bladder, high-frequency current in the treatment of..... 137
relation of to the cancer problem 242

Tumors of the mouth..... 362
Twilight sleep in obstetrics, the present status of, based on a collection study of over 2000 cases 126
Typhoid fever, early—diagnosis of appendicitis in..... 208
immunizing nurses and hospital attaches against..... 45
perforation in..... 627
prevention of by vaccination.... 90
the treatment of by stock typhoid vaccine 113
vaccination, effect of on the widal reaction 266

Ulceration of the cornea, gonorrheal—management of..... 403
Ulcer, duodenal, from a surgical standpoint 285
of the duodenum..... 265
gastric and duodenal—medical treatment of..... 865
scarlet red in the treatment of..... 785
treatment of 417
Ulcers and varicose veins, the operative treatment of 250
new and old: jejunal for duodenal ulcers 439
Ultra-violet rays, filtered—treatment of nevus flammeus and allied conditions by.. 312
Umbilical hernia, end results of..... 516
Uncinariasis, chenopodium in the treatment of 201
Undescended testis, operation for..... 901
Undiluted citrated milk in the feeding of infants 505
Unilateral fused kidney..... 448
Unstable semilunar cartilages of the knee-joint, treatment of..... 787
Ununited and malunited fractures..... 667
Upper air-passages, vasomotor disturbances of the..... 864
Ureter, action of drugs on the..... 584
Ureteral and renal calculus..... 513
stump, complications in connection with after nephrectomy 288
Urethral stricture, the prognosis of..... 400
Urethritis, chronic anterior..... 238
posterior 239
Uric acid and other waste products, the influence of salicylates on the elimination of from the blood..... 191
Urinary bladder, hernias of the..... 893
Urine formation by the perfused kidney.... 128
Uses and abuses of massage..... 780
Uterine disease, newer methods of treatment for 44
fibroids, x-ray treatment of..... 56
hemorrhage, treatment of by the Roentgen ray..... 357
prolapse, etiology of 734

Vaccination against smallpox, the how and why of..... 54
and smallpox, the truth about..... 485
for the prevention of typhoid fever..... 90
Vaccinations, combined..... 343
Vaccine, pollen, in the treatment of hay-fever 653
stock typhoid—treatment of typhoid fever by 113
therapy and germ infection..... 169
some conditions in which it may reasonably be employed..... 650
treatment of chronic suppurative otitis media 722
of whooping cough..... 885
the status of..... 559
Vaccines and hormones..... 50
bacterial—the applicability of in treatment 615
in the treatment of alveolar osteomyelitis (pyorrhea alveolaris) 875
of arthritis 42
mixed—treatment with..... 333
Vagina and cervix uteri, radium in the treatment of carcinomas of the..... 265
Vaginal discharge, treatment of..... 341
Value of the bromides in the treatment of epilepsy 774
of the lactic acid bacillus..... 97
Varices and edema of the lower extremities, operative treatment of..... 203
Varicocele, pelvic..... 63
Varicose veins and ulcers, the operative treatment of..... 250
Various methods of treating pleural effusion 171
Vasa epididymis, anastomosis of the in sterility 204
Vas deferens and the testis, a case of failure of union between the..... 362
Vasomotor disturbances of the upper air-passages 864
manifestations in shock, peripheral..... 207
Vedder, Edward B.: The Prevalence of Syphilis 308
Vegetable drugs, the situation regarding.... 471
Venereal disease in England, control of the treatment of by the government 683
in Sweden, notification of..... 602
diseases, final report of the commission on 518
in the army, prevention of..... 737
lesions, light treatment of..... 735
Venesection as a therapeutic measure..... 499
Ventricular fibrillation, relation of to clinical chloroform syncope..... 48
Veratrum, further observations on the clinical actions of 587
Vermijelli and N. C. T., the use of as exterminators of body lice..... 625
Veronal in the treatment of delirium tremens 552
Vesical symptomatology in renal conditions, the significance of..... 399
Vincent's angina 420
Vomiting and diarrhea in children..... 703
in children, toxic—early morning..... 887

Wrist fractures in childhood and adolescence 895
Wandering tapeworm 757
War injuries, early disinfection of..... 289
Warning regarding the use of pituitary extract 255
Wassermann reaction in determining the prevalence of syphilis..... 308
survey, study of a..... 685
Weasel in medicine..... 760
What stomach symptoms justify surgical intervention 345
therapy means..... 641
Whey and fermented milk in infant feeding 272
Whole milk in the artificial feeding of infants 121
Whooping-cough, the use of bromoform in.. 842
vaccine treatment of..... 885
Widal reaction, effect of typhoid vaccination on the..... 266
Woman's milk, a chemical study of, especially its inorganic constituents..... 109
Women's labor in England..... 911
Wound infections and their treatment.. 215, 823
Wounds and suppuration of the joints, the treatment of 65
bullet, of peripheral nerve trunks..... 367
chloride of magnesium in the treatment of 143
gunshot, of the abdominal cavity 288, 370, 371
the treatment of by packing with salt sacs..... 674
in civil practice, primary treatment of.. 889
infected—treatment of by physiological methods 818
in war..... 442
abdominal—treatment of..... 249
some surgical lessons 626
of the abdomen, penetrating..... 679
treated just behind the battle line.. 144
perforating 370, 371
of the chest, perforating and penetrating, with severe hemorrhage..... 746
of the head, gunshot..... 212
perforated—iodoform and bismuth in the treatment of..... 755
septic—ichthyol and glycerin in the treatment of..... 301
sodium hypochlorite in the treatment of..... 507

X-rays in the treatment of exophthalmic goitre 804
treatment of ringworm..... 721
of uterine fibroids..... 56
Xylol in the treatment of pediculosis pubis.. 656

Yeast in the treatment of beriberi..... 579
Yellow fever, malaria, and other conditions, the treatment of hepatic failure in..... 713

Zeppelin raids on England.....755, 834, 910

BOOK REVIEWS.

Albee, Fred H.: Bone-graft Surgery..... 528
Allen, Carroll W.: Local and Regional Anesthesia 529
American Year-book of Anesthesia and Analgesia for 1915. Edited by F. H. McMechan 752
Anders, James M.: A Text-book of the Practice of Medicine..... 68
Atkinson, D. T.: Social Travesties and What They Cost..... 377
Bandler, Samuel Wyllis: The Expectant Mother 682
Bradford, Edward H., and Lovett, Robert W.: Orthopedic Surgery 529
Brooks, Herbert Thomas: Diagnostic Methods 302
Brown, Lawrason: Rules from Recovery of Tuberculosis 525
Carey, Harry W.: An Introduction to Bacteriology for Nurses..... 72
Cobb, Irvin S.: Speaking of Operations..... 149
Cragin, Edwin Bradford: Obstetrics..... 218
Crile, George W.: The Kinetic Drive..... 909
Cullen, Thomas Stephen: Embryology, Anatomy and Diseases of the Umbilicus..... 528
Cunning, Mrs. Joseph: The Healthy Girl.... 908
Da Costa, John C.: The Principles and Practice of Physical Diagnosis..... 148
Davis, Carl Henry: Painless Childbirth and Nitrous Oxide-oxygen Analgesia..... 221
Davison, Charles, and Smith, Franklin D.: Autoplastic Bone Surgery..... 378
Deaderick, William H., and Thompson, Loyd: Endemic Diseases of the Southern States 376
Dercum, Francis X.: Hysteria and Accident Compensation 222
De Schweinitz, George E.: Diseases of the Eye 605
Despard, L. L.: A Handbook of Massage.... 301
Dorland, W. A. Newman: The American Medical Dictionary..... 72
Dupuy, George M.: The Stretcher Bearer.... 74
Dutton, Walton F.: Venesection..... 681
Edwards, Arthur R.: Principles and Practice of Medicine 219
Eliason, E. L.: First Aid in Emergencies... 833
Elsberg, Charles A.: Diagnosis and Treatment of Surgical Diseases of the Spinal Cord and its Membranes..... 833
Fantus, Bernard: Candy Medication..... 302
Fishberg, Maurice: Pulmonary Tuberculosis. 374
Flagg, Paluel J.: The Art of Anæsthesia.... 454
Fox, Herbert: Elementary Bacteriology and Protozoology 377
French, Roy L.: The Home Care of Consumptives 832
Gee, Samuel: Medical Lectures and Aphorisms 149
Gould, George M.: The Practitioner's Medical Dictionary 377
Graham, Edwin E.: Diseases of Children.... 831
Graves, William P.: Gynecology..... 527
Griffith, J. P. Crozer: The Care of the Baby.. 71
Groves, Ernest Hey: Gunshot Injuries of Bones 74
Hare, Hobart Amory: A Text-book of Practical Therapeutics..... 907
Harris, Wilfred: Nerve Injuries and Shock.. 73
Haworth, Edwin P.: Nitro by Hypo..... 221
Hayden, James R.: Venereal Diseases..... 378
Hertzler, Arthur E.: Surgical Operations with Local Anesthesia..... 529
Hill, Lewis Webb: A Manual of Practical Laboratory Diagnosis 752
Hoffman, Frederick L.: The Mortality from Cancer Throughout the World..... 453
Hogan, Louise E.: Diet for Children..... 302
Horder, Thomas J.: Cerebrospinal Fever.... 72
Howe, Lucien: Universal Military Education and Service 830
Howell, William H.: A Text-book of Physiology 70
Hühner, Max: Disorders of the Sexual Function in the Male and Female..... 910
International Clinics 149, 377, 527, 753, 831
International Medical Annual..... 526
Jackson, Thomas Wright: Plague..... 525
Jones, Robert: Injuries of Joints..... 74
Joslin, Elliott P.: The Treatment of Diabetes Mellitus 750
Krehl, Rudolph: The Basis of Symptoms.... 375
Lane-Claypon, Janet E.: Milk and its Hygienic Relations..... 681
Lowenburg, Harry: A Practical Treatise on Infant Feeding and Allied Topics..... 222
Lowry, Edith B.: Your Baby..... 69
McConnell, Guthrie: A Manual of Pathology 71
McFarland, Joseph: A Text-book upon the Pathogenic Bacteria and Protozoa..... 221
MacCallum, William G.: A Text-book of Pathology 751
Macdonald, D. M.: Practical Prescribing and Treatment in the Diseases of Infants and Children 70
Mackenzie, Sir James: The Principles of Diagnosis and Treatment in Heart Affections 830
MacLevy, M.: Tobacco Habit Easily Conquered 454
MacNamara, N. C.: Instinct and Intellect.... 222
Mathews, Albert P.: Physiological Chemistry 831
Meara, Frank Sherman: The Treatment of Acute Infectious Diseases..... 220
Medical Clinics of Chicago.....377, 754, 908
Medical Record Visiting List..... 72
Medical Visiting List or Physician's Diary for 1917 909
Morison, Rutherford, and Richardson, W. G.: Abdominal Injuries..... 74
Murphy, J. Keogh: Wounds of the Thorax in War 73
National Formulary. Fourth edition..... 752
Niles, George M.: Pellagra..... 220
Nonne, Max: Syphilis and the Nervous System 749
Norris, George William: Blood-pressure: Its Clinical Applications..... 453
Perkins, Charles Edwin: A Manual of Otology 753
Peter, Luther C.: The Principles and Practice of Perimetry..... 454
Pilcher, Paul M.: Practical Cystoscopy..... 530
Pope, Amy Elizabeth: Physics and Chemistry for Nurses..... 753
Power, D'Arcy: Wounds in War..... 74
Practical Medicine Series.....72, 150, 378, 754
Progressive Medicine. Edited by H. A. Hare 301, 526, 754
Ramsay, Andrew Maitland; Grant, J. Dundas; Whale, H. Lawson; and West, Charles Ernest: Injuries of the Eyes, Nose, Throat and Ears..... 223
Ramsay, Walter Reeve: The Care and Feeding of Infants and Children..... 754
Rawling, L. Bathe: Surgery of the Head.... 74
Reference Handbook of the Medical Sciences. Edited by Thomas Lathrop Stedman..... 222
Report of the First Exhibition to South America in 1913..... 375
Royster, Lawrence T.: A Handbook of Infant Feeding 302
Shastid, Thomas Hall: The Description of an Ophthalmoscope 376
Shears, George Peaslee: Obstetrics, Normal and Operative..... 832
Simon, W., and Base, Daniel: A Manual of Chemistry 908
Smithies, Frank: Cancer of the Stomach.... 148
Speed, Kellogg: A Text-book of Fractures and Dislocations..... 529
Squire, J. Edward: Medical Hints for the Use of Medical Officers Temporarily Employed with Troops..... 71
Thomas, B. A., and Ivy, R. R.: Applied Immunology 907
Von Fürth, Otto: The Problems of Physiological and Pathological Chemistry of Metabolism 751
Von Ruck, Karl, and Von Ruck, Silvio: Studies in Immunization against Tuberculosis 681
Wadsworth, William S.: Post-mortem Examinations 70
Waite, Edna Alice, and Peck, Robert Ellsworth: A Purin-free Dietary..... 831
Whiting, A. D.: Bandaging..... 149